TV9-304UW

Specifications

Picture Tube :	9″, 90° Deflection, Aluminized Screen
Transistor :	29 (5 Silicon—including 2 Epitaxial 24 Germanium)
Diode :	16 and 4 Selenium Rectifier
Channel Coverage :	A2 . . . A13 VHF and A14 . . . A83 UHF
Maximum Sensitivity :	10μV/10 Vpp at Picture Tube Cathode
IF Circuit :	4 Stages with 5 stagger tuned elements
	Video IF 26.75 Mc, Sound IF 22.25 Mc,
	Bandwidth 3.0 Mc/—3 dB, IF delivered from UHF Tuner 74 M
Resolution :	Vertical 400 lines, Horizontal 300 lines
Sound System :	4.5 Mc Intercarrier System
	Power Output Stage OTL System 320 mW
	Speaker 2-3/4″ × 4″ Oval Type, 40 Ω Voice Coil
Automatic Control :	Pulse Operated AGC, Diode AFC
Power Requirement :	AC 117 Volts, 50 or 60 c/s, DC 12 V Battery (3.5 AH)
Power Consumption :	AC 17.5 W, DC 12.4 W
Dimensions :	9-5/8″ × 8-5/8″ × 7-3/8″
Weight :	11 lbs. 11 ozs.

SONY®

SERVICING GUIDE

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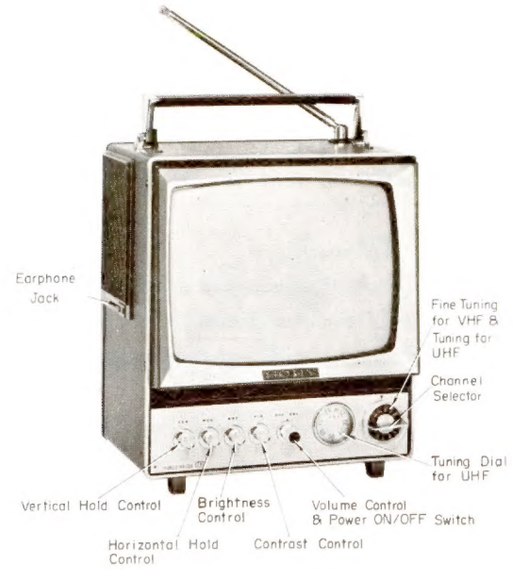
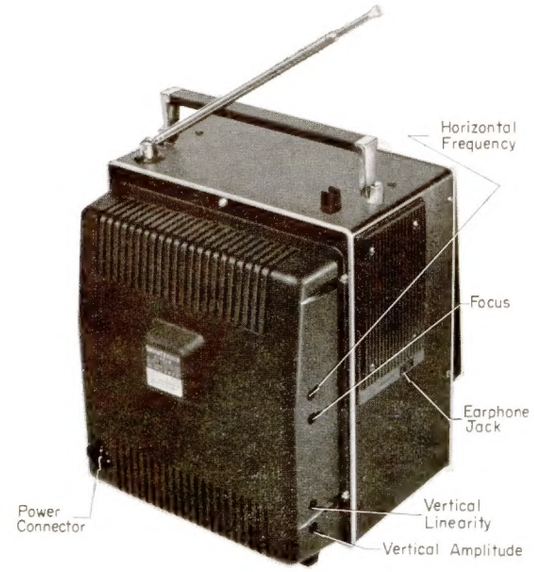


(Fig. 1)



(Fig. 2)

(Fig. 3)

The SONY Transistor TV 9-304UW

General

The SONY Transistor TV 9-304UW is a 9 inch TV by which both VHF and UHF bands can be received without using an external UHF Converter.

The design was made to meet the following requirements.

1) To be not larger in size nor heavier in weight as compared to the Model 9-304W which is the VHF model.
2) To have the lowest power consumption of any mass produced 9 inch VHF/UHF TV set.
3) To operate perfectly as a completely portable TV set under all conditions.
4) To provide facilities for easy servicing.

To fulfil these requirements, many developments were made on the components and the circuit arrangements as explained below.

1. Picture Tube CT468

The resolution of the picture depends greatly upon the construction of the picture tube, and the power consumption of the TV set is much influenced by the construction of the electron gun in the tube. Therefore, the key point of success in making a superior TV set is the improvement of the picture tube. The CT468 picture tube was specially developed for the SONY Transistor TV 9-304UW and has the following features.

a) Resolution

Horizontal 28 lines per cm. (300 lines for full picture)

Vertical 45 lines per cm. (400 lines for full picture)

b) Deflection Power

90 degree deflection and a neck diameter of 20 mm (3/4″) result in lower deflection power although the anode voltage is as high as 9 KV. This gives a brightness of 500 lux.

c) The power required for the heater is less than 1 watt.

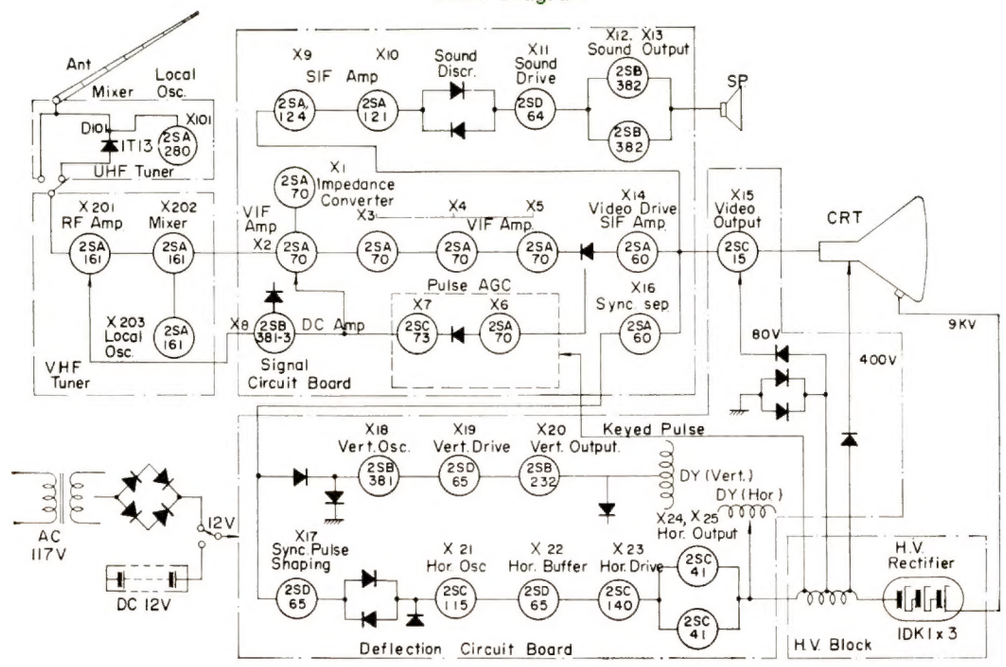
d) The overall length of the tube is 195 mm. (7-11/16″).

e) The cut-off voltage at the grid is made very low by introducing techniques developed in transistor manufacturing into the assembly of the electron gun. Consequently, satisfactory contrast is obtained at low video signal output.

Specifications of Picture Tube CT468

Type :	Rectangular Frame	Diagonal Dimension :	228 mm. (9″)
Neck Diameter :	20 mm. (3/4″)	Full Length :	195 mm. (7-11/16″)
Deflection :	Electromagnetic	Focusing :	Electrostatic Automatic
Deflection Angle :	90 degree	Ion Trap :	Unnecessary
Heater Voltage :	12.0 V, 70 mA	Anode Voltage :	9 KV
Anode Current :	150μA	2nd Grid Voltage :	400 V
Focusing Voltage :	0—200 V	1st Grid Cut-off Voltage :	Approx. —25 V

Block Diagram



(Fig. 4)

Picture Tube

(Fig. 5)

2. The Tuner

The Tuner Block was the key point of success in remaining the size of the set exactly the same as that of the 9-304W, the VHF single band model. The Tuner Block consists of VHF and UHF Tuners of which the former was specially designed to make the size as small as possible.

The UHF Tuner is of newly developed one which includes tuning circuit of particular type and Esaki Diode for the mixer.

Band setting is done by simply turning the Channel Selector Knob for the VHF Tuner to UHF position and by doing thus, the Fine Tuning Knob for the VHF Tuner automatically changes its function to serve as a Tuning Knob for the UHF Tuner.

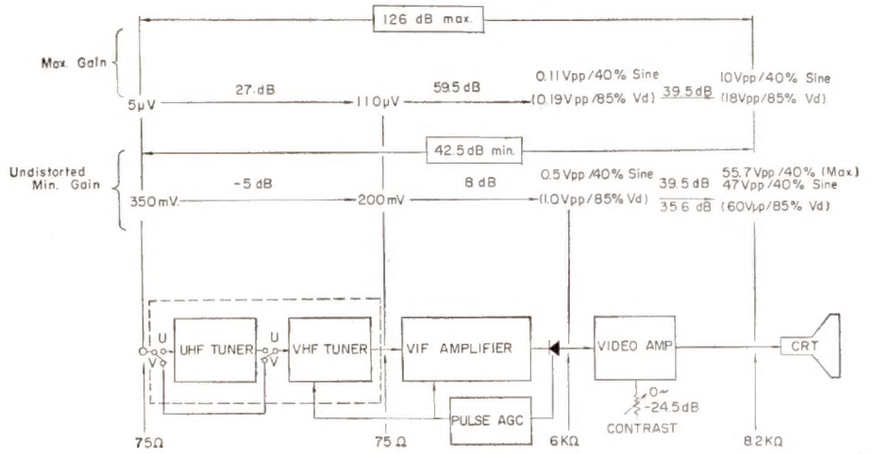
3. Automatic Gain Control Circuit

The AGC system is of pulse type. With the use of this circuit the SONY Transistor TV 9-304UW will maintain synchronization even in moving car where the signal strength varies suddenly and almost continuously and even in the presence of strong engine noise radiation.

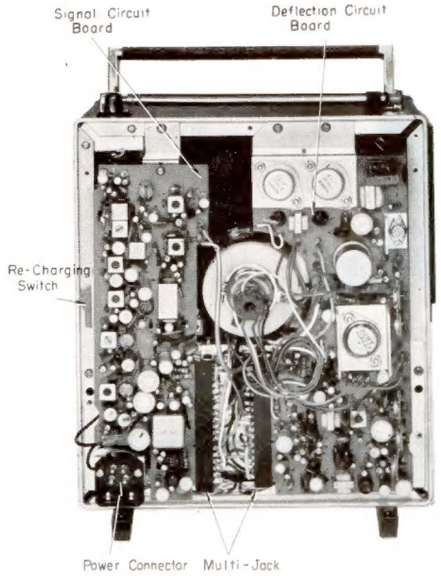
4 Provision for Easy Servicing

Small size usually means difficult servicing. The SONY Transistor TV 9-304UW is divided into five sections for easy service. The sections are : Tuner, Signal Circuit Board, Deflection Circuit Board, High Voltage Block and Power Supply. The Signal Circuit Board and the Deflection Circuit Board are of the Plug-in type so that either of these boards may be removed as a unit and replaced with a new one for easy and rapid repairing.

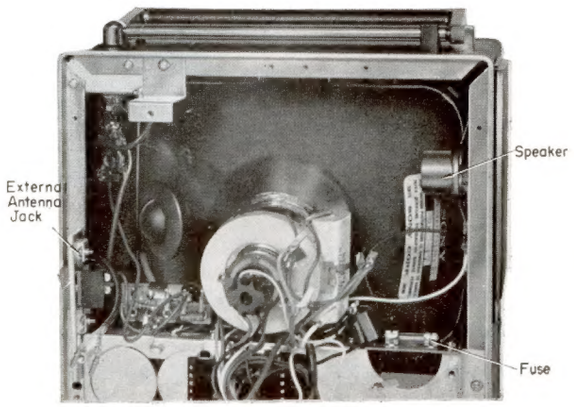
Level Diagram for Video



(Fig. 6)



(Fig. 7)



(Fig. 8)

The Tuner

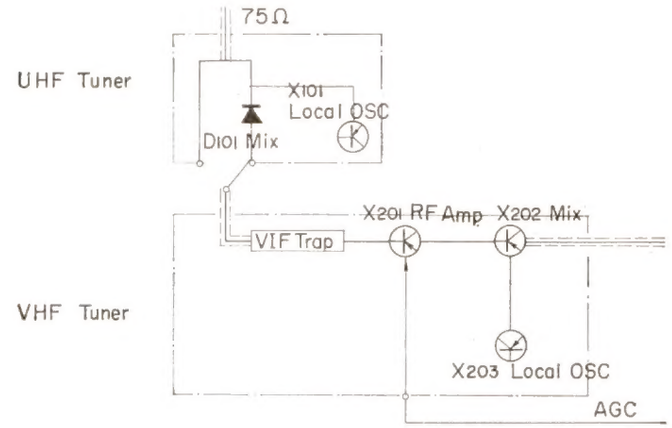
The Tuner Block consists of VHF Tuner and UHF Tuner. As shown in the block diagram, the Input Signal comes directly into the RF amplifier stage of the VHF Tuner in VHF reception while in UHF reception, the Input Signal is fed to the RF amplifier stage of the VHF Tuner after it is converted into VHF signal of which center frequency is 74 Mc through the UHF Tuner.

1. VHF Tuner

The VHF Tuner uses three PNP Mesa Type Germanium Transistors (2SA161), one is used in the RF Amplifier,

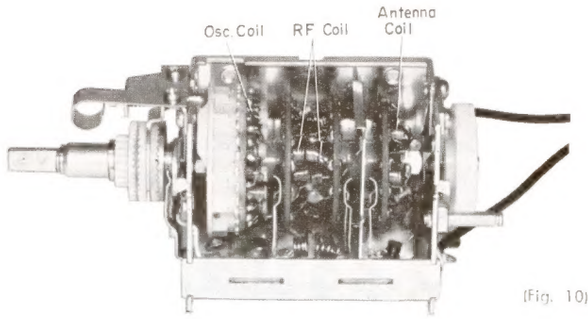
one is the Mixer and one in the Local Oscillator. A Disc Type Turret is used for mounting all the coils and contacts for Channel Selection. Special Contact Points have been designed for easy and positive channel selection. The transistors and other circuit parts are mounted directly above the Channel Switch and are enclosed within the Tuner Shield. RF coils for each channel are connected in series but the Oscillator Coil for each channel can be adjusted independently. The AGC characteristics of the set is excellent as the AGC action is extended to the IF Amplifier and to the RF Amplifier Stage in the VHF Tuner. The Set with the built-in Telescopic Antenna extended to its full length can be operated at a field strength of as much as 100mV/m without overloading the circuit.

Block Diagram for the Tuner Block

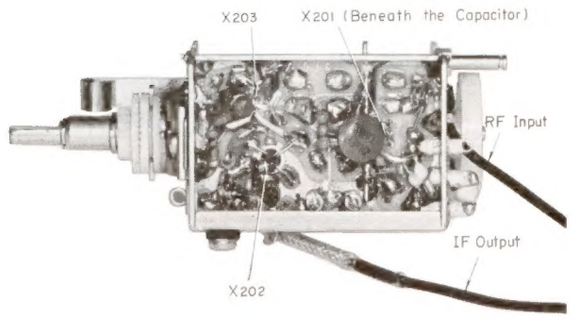


(Fig. 9)

VHF Tuner



(Fig. 10)



(Fig. 11)

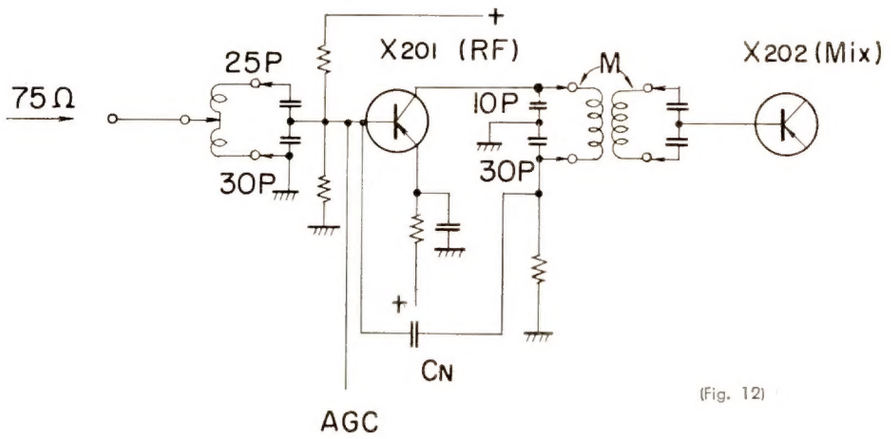
a. RF Amplifier

The Antenna Impedance is 75Ω. For correct impedance matching between the Antenna and the Transistor Input, taps are used on both sides of the tuned circuit. A tap on the Inductance is made on the Antenna side and a tap is made on the Capacitance on the Transistor side for impedance matching. The RF Transistor Output is double tuned with mutual coupling (double peaks). This in combination with the single peak of the input circuit gives an essentially flat Bandwidth of 6 Mc for this stage.

A neutralizing capacitor is used in the base circuit as shown in Fig. 12 to prevent oscillation due to stray capacitance.

A gain of 14 dB is possible at 200 Mc with a circuit of this type but too much gain tends to make the Set unstable and hence the gain has been kept to be about 10 dB in our circuit. The gain on the lower channels tends to be higher than that on the higher channels, and so the damping resistors are inserted in the circuit of the lower channels to make the gain difference between the higher and lower channels within ±1.5 dB.

Basic Circuit for RF Stage



(Fig. 12)

b. Mixer Circuit

The Mixer Transistor 2SA161 is emitter-grounded. The Impedance Matching is made by a capacitance divider in the same way as in the RF Amplifier. The Local Oscillator Signal is injected into the base of the transistor. The power dissipation in the mixer transistor is very much less (about 1/30—1/50) than the plate loss of the tube mixer. The voltage of the Local Oscillator Signal injected is about 0.2 Vrms, which is also much smaller (1/10—1/20) than that in tube mixer. Furthermore, the Gm of the Transistor Mixer is high and hence the trouble with the mixer noise encountered in tube circuits are of no consequence here in our circuit. This circuit is also neutralized to prevent undesired oscillation.

c. Local Oscillator

The Local Oscillator uses a Colpits Circuit. This circuit is well suited for this use as it does not require a tap on the oscillator coil. The transistor (2SA161) is emitter grounded. The drift is kept within 200 Kc. As mentioned before, each oscillator coil is independent of the others so that the oscillation frequency can be adjusted from outside the Tuner by adjusting the screw type cores. The Cylindrical Fine Tuning Capacitors are separately shielded to prevent radiation from the set. The adjustable range of the Local Oscillation is approx. 1.6 Mc for Channel 2 and approx. 3 Mc for Channel 13.

2. UHF Tuner

The UHF Tuner consists of three sections, the Pre-selector, Mixer, Local Oscillator and all the circuit parts are enclosed in a shield case separated into three rooms by two shielding walls. Each section includes individual

Tuning Circuit using a metal strip which serves as an Inductance and a Tuning Capacitor driven by a single shaft. The metal strips in each section are electro-magnetically coupled for signal transmission. UHF/VHF switch is provided on the back side of the Tuner and is operated by the Switch Lever linked with the Channel Selector Shaft in the VHF Tuner. When the Channel Selector Knob is set to the position designated "U" the switch changes the circuit to receive UHF signal and simultaneously the Fine Tuning Knob of the VHF Tuner changes its function to drive the Tuning Capacitor Shaft in the UHF Tuner.

The UHF Tuner covers US UHF Channels 14—83 and converts the UHF signal into VHF signal of which center frequency is 74 Mc to be transmitted to the VHF Tuner. Each section of the UHF Tuner is as follows :

a. Pre-selector Section

The Pre-selector consists of a Tuning Circuit and is enclosed in the first room of the shield case. The Input Signal is transmitted to the metal strip from the lead wire for the Antenna Circuit.

b. Mixer Section

The Mixer Section enclosed in the second room consists of the Tuning Circuit same as that in the first room and the Mixer Circuit using one Esaki Diode. The Input Signal to the Pre-selector is transmitted to the metal strip in this section through a window made on the shielding wall between the rooms.

The Mixer Circuit receives the Input Signal from the metal strip in the Tuning Circuit in this section at the lead for the Esaki Diode which is also made of a piece of metal strip.

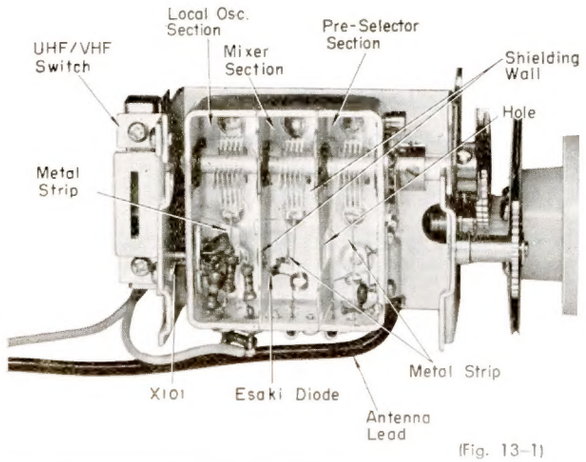
c. Local Oscillator Circuit

This section uses one PNP Mesa Type Germanium Transistor 2SA280 specially developed for this purpose by SONY and is enclosed in the third room. The Local Oscillation Signal is injected into the Esaki Diode in the Mixer Section at the metal strip lead extending from the second room through a window made on the shielding wall between the second and the third rooms. The transmission of the Local Oscillation Signal is made through the electro-magnetic coupling also.

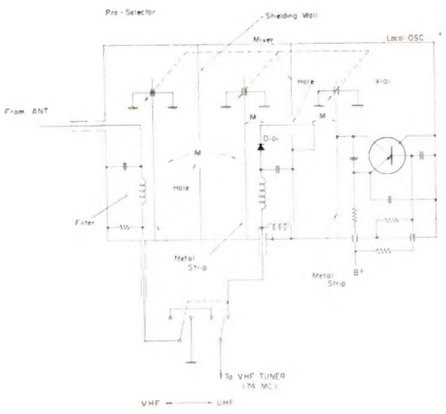
Note :

To obtain satisfactory result, the Telescopic Antenna should be extended or retracted according to the Channel to be received. For the VHF Channels from 2 to 6, the Telescopic Antenna should be extended to its full length while for the VHF Channels from 7 to 13 and for the UHF Channels it should be fully retracted.

UHF Tuner



(Fig. 13-1)

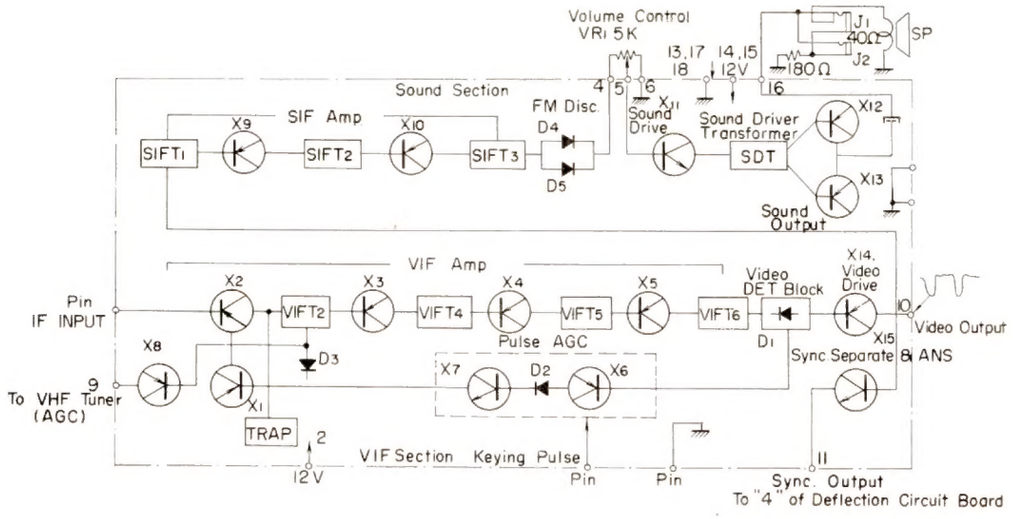


(Fig. 13-2)

Signal Circuit Board Section

The Signal Circuit Board Section includes the Video IF, AGC, Sound Amplifier, Video Drive and Synchronizing Pulse Separation Circuits.

Block Diagram for Signal Circuit Board



(Fig. 14)

1. Video IF Section

The Video IF Section cosists of three stages with three stagger tuned elements. The Video IF is 26.75 Mc while the Sound IF is 22, 25 Mc. The Bandwidth of this section is 3 Mc.

2. Automatic Gain Control

The Automatic Gain Control is made at the RF Amplifier Stage of the VHF Tuner and at the first stage of the Video IF Amplifier. For Video IF Amplifier, the Ultra-linear AGC of which operation is as explained below is used. The AGC signal is applied to the Base of X6 from the tap on the secondary winding of VIFT5 which feeds the Video IF Signal to the Video Detector. The Pulse generated at the Flyback Transformer is applied to the collector of X6 so that X6 operates only during the synchronizing period. The AGC Signal is amplified by X6 and rectified by D2 and then applied to the Base of X7 through a filter circuit. The time constant of this circuit is made very small so that the AGC response is extremely fast, thus permitting operation in cars where the signal level varies with extreme rapidity. Then the AGC current is amplified by X7 and applied to the Base of X1 which is connected in series with the Emitter of X2, the first VIF Amplifier Since the Impedance between the Collector and the Emitter of X1 varies in accordance with the AGC current applied to the Base of X1, the negative feedback to X2 varies in amount corresponding to the variation of the AGC current. This means that the AGC current controls the gain at the first stage of the VIF Amplifier in which X2 is included. The main features of the Ultra-linear AGC are :

1) Quick Response

The AGC action is much faster than in conventional circuits because the Time Constant of the filter circuit is very small (approx. 2/1000 second) comparing to that in conventional one (1/10—1/20 second). Accordingly, stable recetion is achieved even when the input signal level varies at a rate of 1/100 second.

2) Wider Effective Range

Effective AGC action is assured even when the input signal level varies in very wide range that may cause distortion in conventional circuits.

3) Noise Free Reception

The AGC action is hardly influenced by noise since the Synchronizing Pulse only of the signal is utilized.

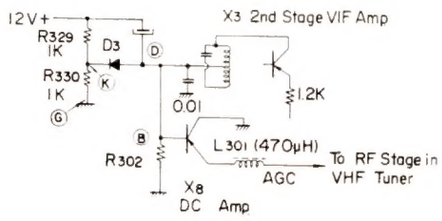
On the contrary, in the ordinary peak value system, the AGC voltage varies considerably with the noise content of the Video Signal.

4) Effective AGC Action

The AGC action is quite effective due to higher gain in the AGC loop. Stability against the variation of the temperature and of power supply voltage is secured also.

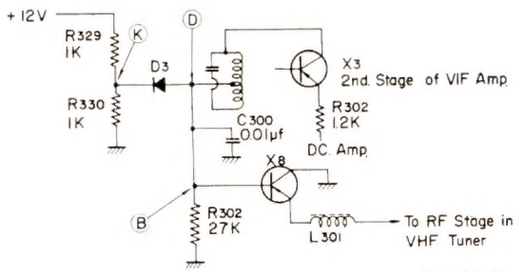
The operation of the AGC on the VHF Tuner is as follows. See Fig. 15. The key point of this circuit is Diode D3 which conducts only when the Forward Bias Voltage exceeds 0.3 Volt. The potential at the negative terminal of the D3 is kept at 6 Volts with respect to the chassis by a voltage divider consisting of R329 (1KΩ) and R330 (1 KΩ) while the potential at the positive terminal varies according to the Collector Current of X3 in the VIF Amplifier. Therefore whether the D3 conducts or not depends upon the Collector Current of X3.

AGC on Tuner



(Fig. 15-1)

Basic Circuit of AGC for VHF Tuner



(Fig. 15-2)

a. Condition under which the D3 conducts :

Since the D3 conducts only when the Forward Bias Voltage exceeds 0.3 Volt, as mentioned above, the potential at the point D or B should be higher than 6.3 Volts. This means that the D3 starts to conducts as soon as the following relation is established.

$$I_{C\times 3} \geqq \frac{6.3\ (V)}{R_{302}}$$

where $I_{C\times 3}$=Collector current of X 3

When the D3 conducts $I_{C\times 3}$ starts to flow through both R302 and the D3 branch. Under this condititon, the equivalent resistance of the branch D—D3—R330 is given by the following.

$$Req = \frac{E_{D-K}+E_{K-G}}{I_{D3}} = \frac{0.3+(6+1000\times I_{D3})}{I_{D3}}$$

where I_{D3}=Current flowing through D3

DC load for the Collector of X3 is considered as R302 and Req connected in parallel.

At zero input signal, $I_{C\times 3}$ remains maximum value of approx. 1mA while I_{D3} reaches its maximum value of approx. 700μA and the potential at the point D does not rise over approx. 7 Volts in any circumstance

b. Condition under which the D3 cuts off :

If $I_{C\times 3}$ decreases to the va'ue below 6.3 V/R302, the potential at the point B drops to the value below 6.3 Volts and the D3 cuts off.

c. Operation of X8 in the DC Amplifier :

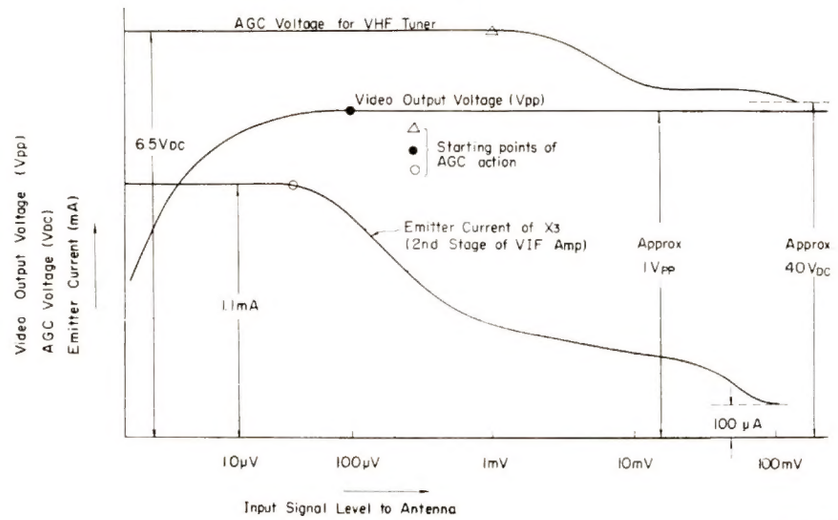
The Emitter of X8 is directly connected to the Base of X201 in the RF Amplifier of the VHF Tuner of which potential is kept at 6.5 Volts. Therefore, the potential at the Emitter of X8 is kept at 6.5 Volts also. On the other hand, X8 does not conduct until the voltage between the Base and the Emitter exceeds 0.3 Volt. This means that X8 starts to conducts after the potential at its Base, that is the potential at the point B, drops to 6.2 Volts with respect to the chassis. In other words, AGC action does not effect

until the potential at the point B drops to 6.2 Volts. As apparent in the description mentioned above, AGC on the VHF Tuner effects only when the Collector current of X3 remains the values given by

$$I_{\times C3} \geq \frac{6.2\ (V)}{R_{302}}$$

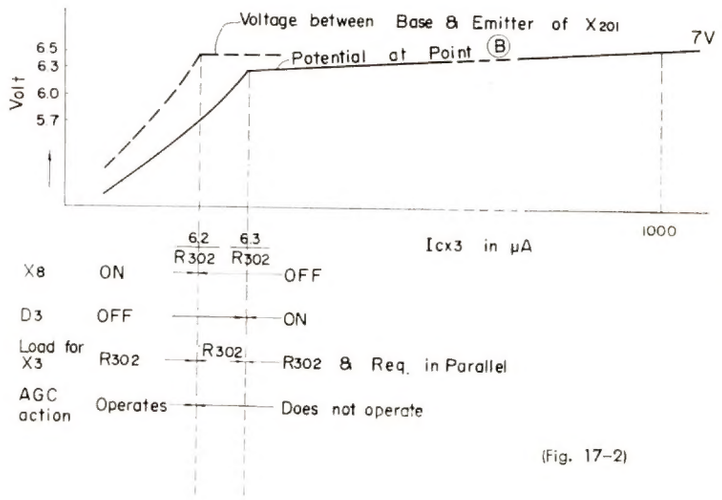
The summary of the AGC action is as follows :

Tuner AGC



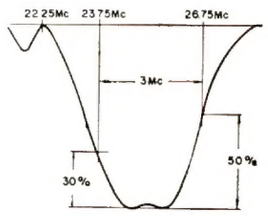
(Fig. 16)

Overall AGC Characteristics



(Fig. 17-2)

VIF Response



(Fig. 17-1)

3. Sound Amplifier Section

The Sound Amplifier Section has two IF Stages, Ratio Detector and two Audio Amplifier Stages. However, the IF Amplifier can be considered substantially consisting of three stages because the Video Drive Stage works as a SIF amplifier also. The Output Stage uses the SEPP-OTL (Single-ended Push-pull No Output Tranformer) system. The Speaker size is 2-3/4″×4″ and its impedance is 40Ω. There is a shield plate on SIFT3 to prevent the pulse from the Picture Tube Deflection Yoke to interfere with the sound. The maximum output is 320 mW at 10% distortion.

4. Video Driver

The Video Driver Circuit is of Emitter Follower Type (Collector Grounded). The Output Impedance is low and

this circuit has good frequency characteristics. The Video Signal and Synchronizing Pulse are separated at the Emitter of X14 while the sound is taken out at the Collector of the same transistor.

5. Sychronizing Pulse Separation

The Synchronizing Pulse is separated at X16 and the Vertical Pulse is taken out at its Collector.

This stage includes Noise Limiter for the Synchronizing Pulse. This permits stable operation of the set in a car without fear of interference from the ignition sparks and other pulsive noises.

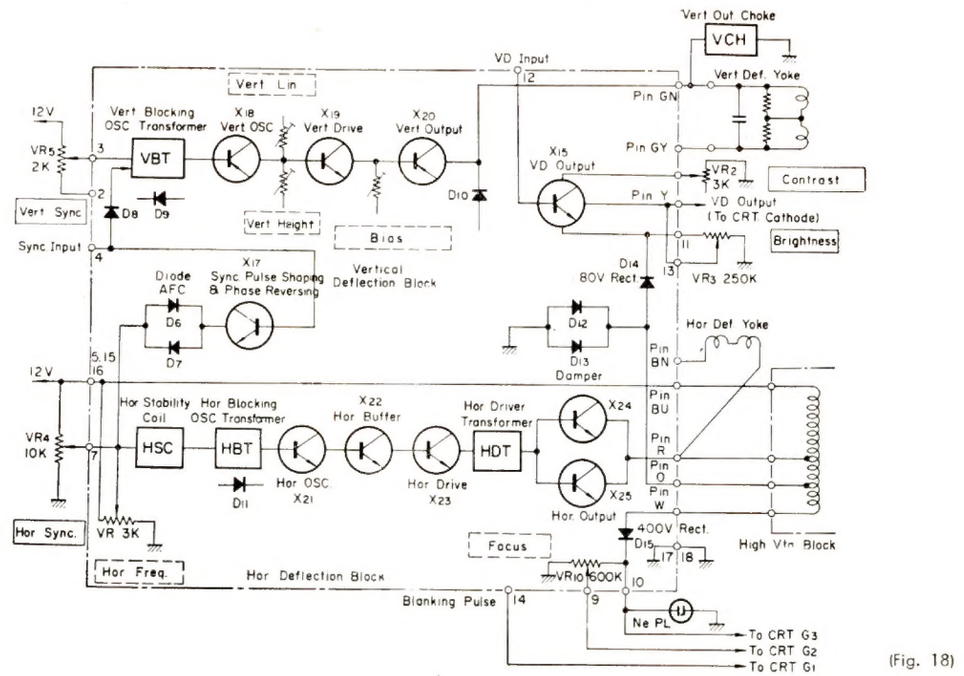
Deflection Circuit Board and High-Voltage Block Sections

The Deflection Circuit Board contains the Video Output and the Vertical and Horizontal Deflection Circuits.

1. Video Output Circuit

A Mesa Silicon Transistor (2SC15, X15) is used in the Video Output Circuit. Over 50 Vpp of output is obtained from this circuit by supplying 80 Volts to the collector of X15. The Picture Tube requires 30 Vpp for sufficient contrast. The Contrast Control is obtained by varying the feedback current by means of the variable resistor VR2 which is located in the Emitter Circuit of X15. The gain of the stage can be varied by 24 dB with this control. The frequency response is almost flat to 3 Mc by the use of Shunt-peaking (L501-R508) and Series-peaking (L502-R509). Since the Video IF Bandwidth is 3 Mc and the beam spot of the Picture Tube is very small, a very sharp picture is obtained. The Horizontal resolution is more than 300 lines and the Vertical 400 lines. X15 is cut-off during Horizontal Blanking Period by the application of pulse from the Horizontal Deflection Circuit. The Horizontal Blanking Pulse is applied to the Emitter of X15 while the Vertical Blanking Pulse is applied to the first grid of the Picture Tube.

Block Diagram for Deflection Block



(Fig. 18)

2. Vertical Deflection Section

The Vertical Deflection Saw-tooth Wave is generated by blocking oscillation in the circuit of X18. It is then amplified by X19 and X20 and applied to the Vertical Deflection Yoke of the Picture Tube. Vertical Amplitude and Linearity are adjusted by Variable Resistors VR7 and VR8 in the Base Circuit of X19. The Back Pulse is suppressed by Clipping Circuit using a Diode D10 in the collector circuit of X20, the Vertical Output Transistor. The Pulse is taken out at the terminal of D10.

The heat generated in X20 is dissipated through a large heat sink and the variation of the characteristics due to the temperature difference is compensated by the thermistor located in the Base Circuit of X20. For the effective compensation, the thermistor is placed in a cavity provided on the bottom of X20.
The Variable Resistor VR9 in the Base Circuit of X20 serves to adjust the operating point of X20 and it is not necessary to re-adjust it except when X20 is replaced.

3. Horizontal Deflection Section

The Horizontal Deflection Pulse is generated by Blocking Oscillation in the circuit of X21 and is amplified by X23 which drives X24 and X25. X24 and X25 generate the Saw-tooth Wave to drive the Horizontal Deflection Coil. The Horizontal Output Transistors X24 and X25 are also connected to the Horizontal Output Transformer and supply the input for the High Voltage Circuit with the Flyback Pulse during Cut-off. All of the transistors except X22 in the Horizontal Deflection Circuit are of the Silicon Type. This assures stable operation almost free from temperature effects.
Two Diodes D12 and D13 connected to the tap of the Horizontal Output Transformer operate as a damper to improve the linearity of the wave form which has tendency of being affected by high collector saturation resistance in the silicon transistors.
The capacitor C815 connected in series with the Horizontal Deflection Coil serves to compensate the deflection current to correct deteriorated linearity due to curvature of the screen of the Picture Tube.
For AFC, the negative pulse is taken from the collector of X23, the Horizontal Driver and is integrated after it is delayed by L601. The Saw-tooth Reference Wave obtained through this process is applied to the Base of X21 to control the blocking oscillation.

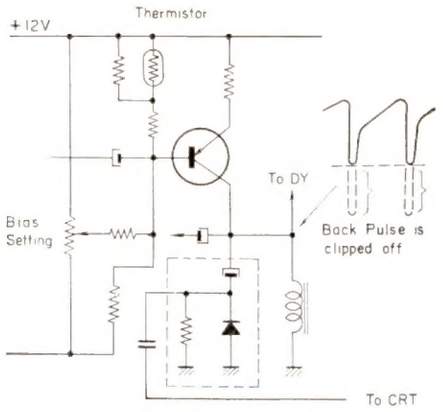
4. High Voltage Block

The High Voltage Block consists of the Horizontal Output Transformer and the High Voltage Rectifier. All are housed together in one metal case. The Flyback Pulse is stepped up, rectified and resulting voltage of 9 KV, 400 V and 80 V are applied to the Anode, Second Grid of the Picture Tube and the Video Transistor X15 respectively. The 9 KV is obtained by means of the three rectifier tubes in voltage tripler circuit.

5. Focus Adjustment

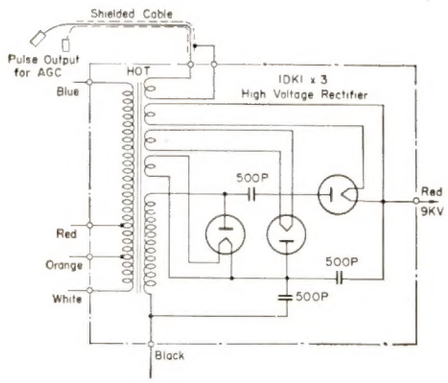
The Voltage for the Second Grid of the Picture Tube goes also to the Potentiometer VR10. The focusing Voltage is obtained from this Potentiometer and is variable between 0 and 230 V.

Diode Clipping Circuit

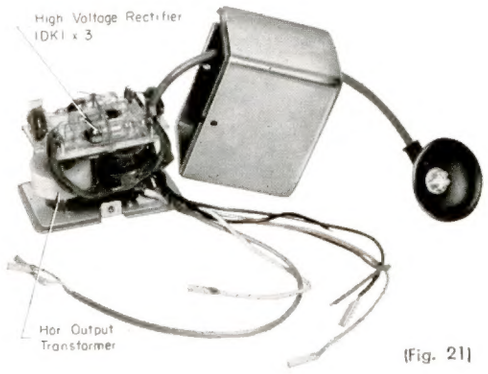


(Fig. 19)

High Voltage Block



(Fig. 20)

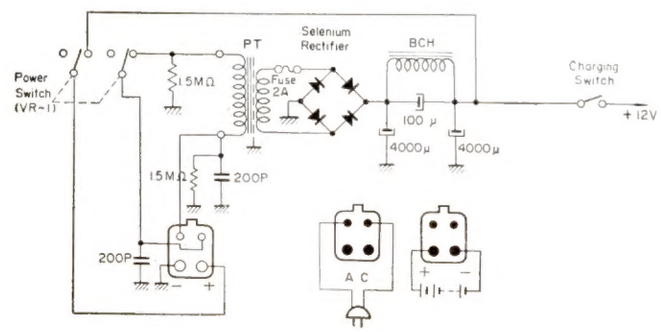


(Fig. 21)

Power Supply Section

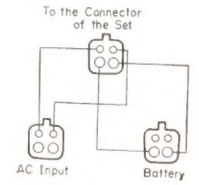
117V AC is converted to 12V DC by four Selenium Rectifiers in a Bridge Connection as shown in Fig. 22. Power Transformer with oriented core is used in this set to prevent any trouble from Leakage Flux. The primary winding of the Power Transformer is grounded to the chassis through two 1.5 MΩ resistors in accordance with the safety measure provided in the specifications LA, CSA etc. of the United States and Canada. Accordingly, one may feel a slight electrical shock when he touches the Cabinet of the set operated with AC Power Supply. This is harmless and is not to be mistaken as an indication of trouble with the set.

Connection of the Power Supply



(Fig. 22)

Charging Adapter



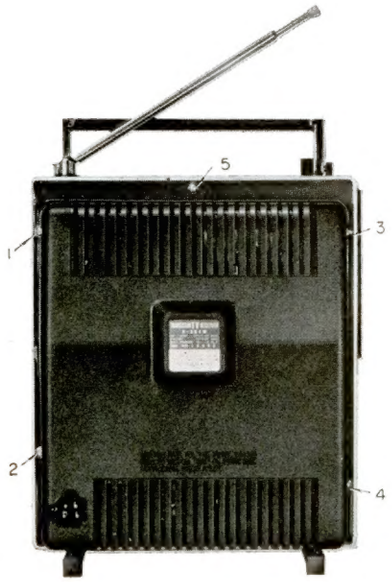
(Fig. 23)

Method of Disassembling the Set

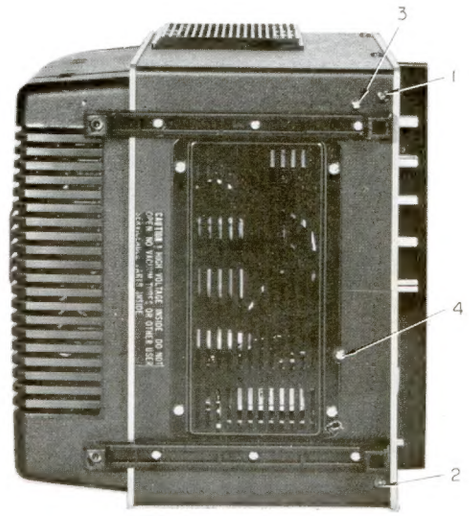
To Open the Back Cover of the Cabinet (Remove the five screws shown in the Fig. 24.)

To Remove the Front Control Panel

1. Pull out all the Control Knobs straight. The Channel Selector Knob can be removed by pulling the Fine Tuning Knob out.
2. Place the Set with the side surface down and remove two screws 1 and 2 on the bottom of the Cabinet. See the Fig. 25.

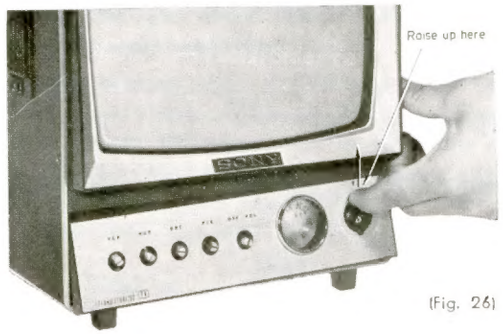


(Fig. 24)



(Fig. 25)

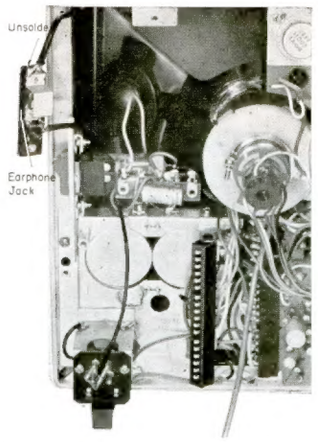
3. Raise up the Front Control Panel with the finger at the hole for the Channel Selector Knob as shown in the Fig. 26.



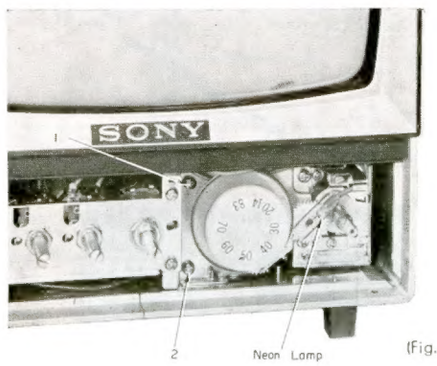
(Fig. 26)

To Remove the Tuner Block

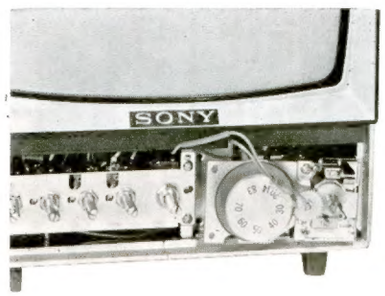
1. Open the Back Cover of the Cabinet.
2. Remove the Signal Circuit Board (refer to " To Check and to Remove the Signal Circuit Board ").
3. Remove the External Antenna Jack from the Cabinet by loosening the holding screw located below the same. See the Fig. 27.
4. Unsolder the Shielded Cable extending from the Telescopic Antenna at the upper terminals of the jack. See Fig. 27.
5. Unsolder the Orange wire at the terminal of the 5-P Tie-points. See the Fig. 27.
6. Remove the Front Control Panel and push the Neon Lamp out toward the left to disengage from the holder. See the Fig. 28.
7. Remove the two screws 1 and 2 in the Fig. 28. The Tuner Block can now be taken out from the Cabinet by pulling forward.
8. To separate the Tuner Block completely from the Cabinet, unsolder the two wires, one is Red and the other Yellow, at the terminals on the back of the Tuner Block.



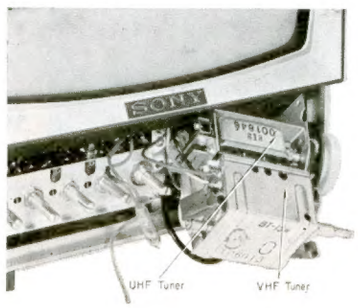
(Fig. 27)



(Fig. 28)

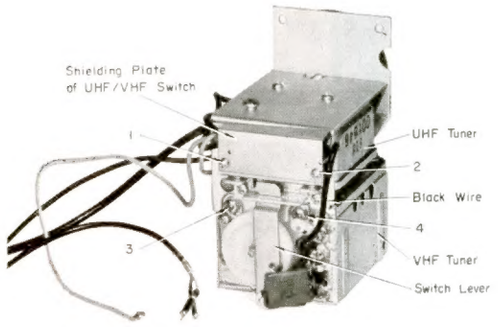


(Fig. 29)

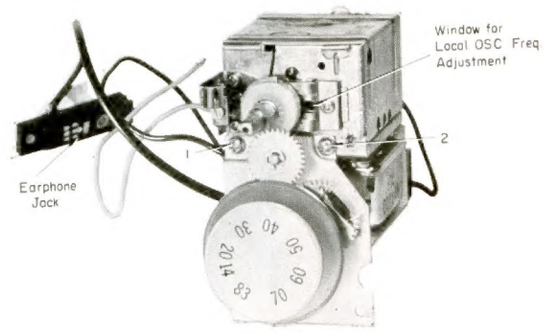


(Fig. 30)

9. To separate the UHF Tuner from the VHF Tuner, remove the Shielding Plate of the UHF/VHF Switch on the back of the Tuner Block by removing the two screws 1 and 2 in the Fig. 31 and unsolder the Black wire extending from the VHF Tuner at the terminal of the switch.
10. Remove the four screws 3 and 4 in the Fig. 31 and 1 and 2 in the Fig. 32.



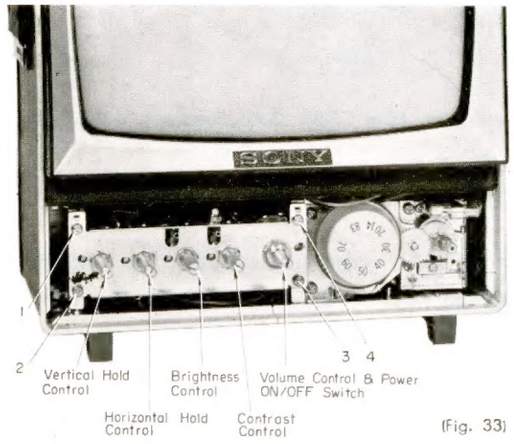
(Fig. 31)



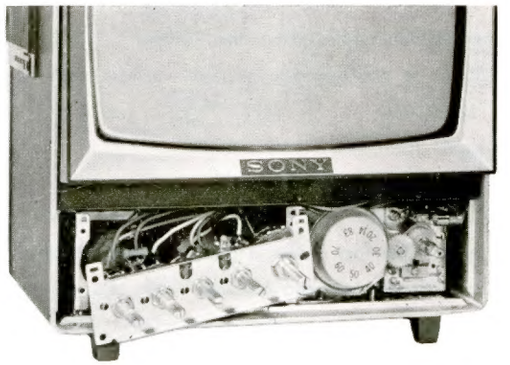
(Fig. 32)

To Remove the Potentiometer for Volume Control, Contrast Control, Brightness Control, Horizontal Hold and Vertical Hold

1. Remove the Front Control Panel.
2. Remove the four screws 1, 2, 3 and 4 shown in the Fig. 33.
3. Pull out the Holding Plate for Potentiometer from the cabinet. Be careful not to pull it too much to prevent the wires connected to the Potentiometers from damage.



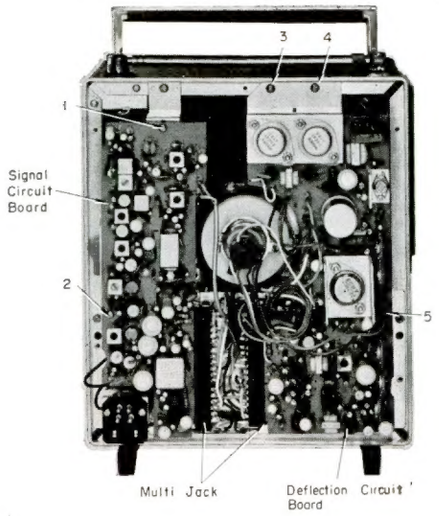
(Fig. 33)



(Fig. 34)

To Check and to Remove the Signal Circuit Board

1. Remove the two screws 1 and 2 in the Fig. 35.
2. To Check the printed side of the Circuit Board, pull its left edge. The Circuit Board will swing around the axis of the Multi-jack located at the right hand side of the Circuit Board. Be carefull not lose two small rubber cushions on the printed side of the Circuit Board at the screw holes.
3. To Remove the Circuit Board, pull out the Shielded Cables, one for the IF Input and the other for the Keying Pulse Input, from the pins on the Circuit Board.
   The pin designated with the Red Mark is for the Inner Conductor of the IF Input Cable while the one designated with the + Mark is for the Inner Conductor of the Keying Pulse Input Cable.
4. Then pull out the Circuit Board toward the left.



(Fig. 35)

To Check and to Remove the Deflection Circuit Board

1. Remove the three screws 3, 4 and 5 in the Fig. 35.
2. To Check the printed side of the Circuit Board, pull its right edge. The Circuit Board will swing around the axis of the Multi-jack located at the left hand side.
3. To Remove the Circuit Board, pull out the eight Lead Wires from the pins on the Circuit Board. The colors of the Lead Wires are as follows :

Marking for the pins	R	O	BN	BU	W	Y	GN	GY
Colors of the Lead Wires	Red	Orange	Brown	Blue	White	Yellow	Green	Gray

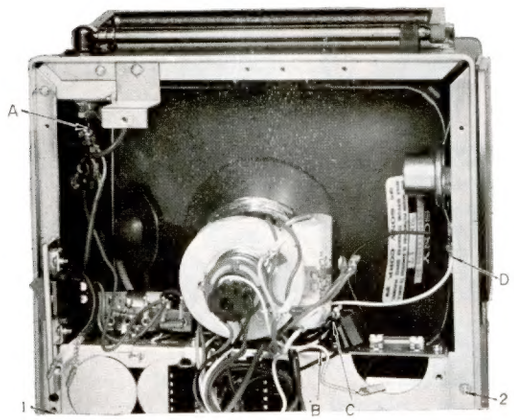
4. Then pull out the Circuit Board toward the right.

To Remove the Chassis from the Cabinet

The Chassis is mounted with the High Voltage Block, Power Transformer, Filter Choke Coil, Selenium Rectifier and Filter Condensers.

To Remove the Chassis

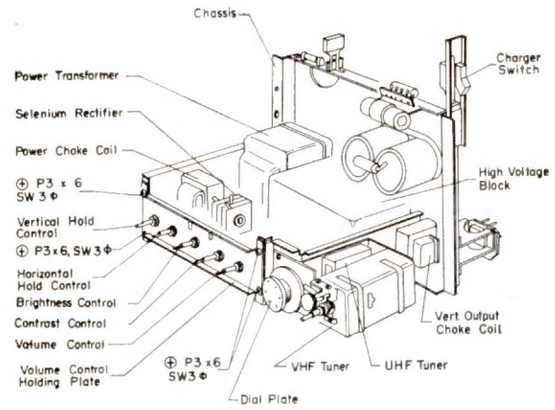
1. Pull out all the Control Knobs.
2. Open the Back Cover of the Cabinet and Remove the Signal Circuit Board and the Deflection Circuit Board.
3. Remove the two screws 3 and 4 on the bottom of the Cabinet. See the Fig. 25.
4. Unsolder the following Shielded Cable and the Lead Wires. See the Fig. 36.
   a. Shielded Cable at the bottom of the Telescopic Antenna (Position A).
   b. Two Black Wires which are the Grounding Wire for the Picture Tube and the Lead Wire for the Speaker respectively at the Tie-points located near the Fuse (Position B and C).
   c. White Wire at the Speaker Terminal. (position D)
5. Remove the External Antenna Jack by loosening the securing screw.
6. Pull out the Anode Connector and the Socket from the Picture Tube.
7. Remove the two screws 1 and 2 and pull out the Chassis from the Cabinet with a slight lifting motion. See the Fig. 36.
8. To Separate the Chassis completely from the Cabinet, Unsolder the Red and the Green lead Wires extending from the Deflection Yoke on the Picture Tube at their tips where the same colored Lead Wires are jointed respectively.



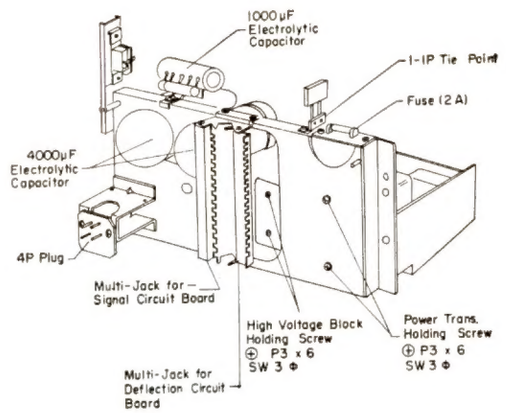
(Fig. 36)

Front View of Chassis

Back View of Chassis



(Fig. 37)



(Fig. 38)

To Remove the High Voltage Block

Remove the two Philips screws beneath the Multi-jack for Deflection Circuit Board.

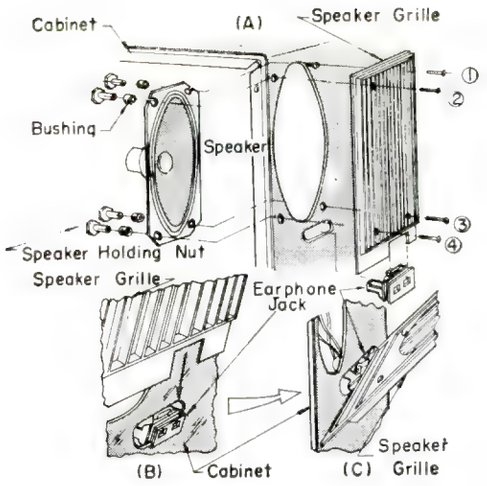
To Remove the Speaker (See the Fig. 39)

1. Remove the four screws 1, 2, 3 and 4 while holding the Speaker with hand.
2. Remove the Speaker Grille by pushing it straight up to disengage from the Earphone Jack. The Speaker can be removed together with the Earphone Jack.

Note :

To attach the Speaker Grill to the Cabinet do it according to the following procedures to prevent the Earphone Jack from being damaged.

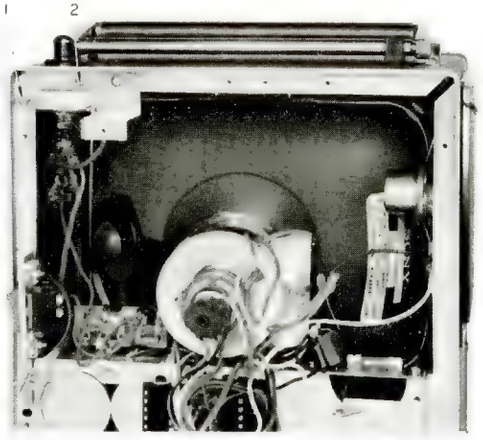
1. At first, insert the Earphone Jack into its position matching the groove of the Earphone Jack to the edge of the hole on the Cabinet.
2. Tilt the Earphone Jack as shown in the Fig. 39.
3. Fit the gain at the lower end of the Speaker Grille to the Earphone Jack.
4. Bring the Speaker Grille to the position by pushing its upper part against the Cabinet.



(Fig. 39)

To Remove the Telescopic Antenna

1. Open the Back Cover of the Cabinet.
2. Remove the Signal Circuit Board
3. Unsolder the Shielded Cable at the bottom of the Telescopic Antenna
4. Remove the two screws 1 and 2 in the Fig 40
5. Push the Antenna into the Cabinet. The Antenna will be removed with the Antenna Bushing left on the top of the Cabinet.



(Fig. 40)

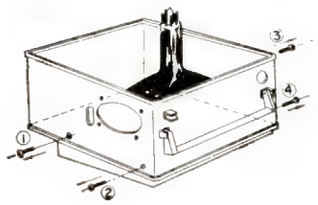
To Remove the Picture Tube

1. Remove the Chassis from the Cabinet.
2. Remove the Deflection Yoke by loosening the screw located on the brass Holding Band.
3. Place the Set with its Front Side down This is quite important to prevent the Picture Tube from damage due to accidental drop that might be happened in the following step.
4. Remove the four screws 1, 2, 3 and 4 in the Fig. 41
5. Lift the Cabinet and the Picture Tube will remain on the table together with Mask.
6. Remove the Picture Tube Holding Ring from the tube by loosening the nut shown in the Fig. 42

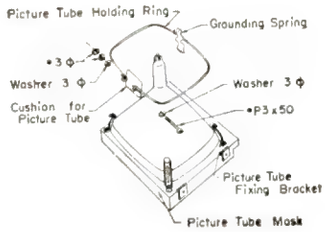
7. Remove the four screws 5, 6, 7 and 8 shown in the Fig. 43.

Note :

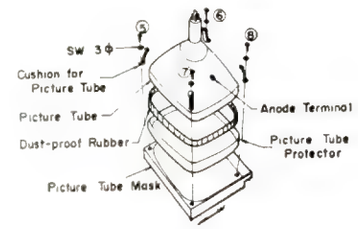
The position of the Anode Terminal of the Picture Tube should be determined according to the Fig. 43 when the Tube is to be mounted.



(Fig. 41)



(Fig. 42)



(Fig. 43)

Trouble Shooting

by Replacement of the Defective Block

Provisions have been made in this TV for easy servicing. The main part of the set is made of four Blocks of the Tuner, the Signal Circuit Board, the Deflection Circuit Board and the High Voltage Block. Each of these Blocks has complete interchangeability and hence the servicing can be performed by simply replacing the defective Block with a new one.

The way of judging which Block is defective and the method of replacing the Block will be giver below.

Replacement Blocks :

Tuner, Signal Circuit Board, Deflection Circuit Board and High Voltage Block

Tools and Meters :

Multi-meter of internal resistance around 20 KΩ/V

Cord with Clips.....2 pcs.

Electrolytic Capacitor,, 3μF, 500WV or more .....1 pc.

Resistor around 15KΩ .....1 pc.

Screw Drivers

For 3 mm Screws, Philips and ordinary

For 2.6 mm Screws, Philips and ordinary

No. 3 for watch for adjustment of local oscillator

Tweezers

Soldering Iron

Raster

1. No Raster and No Sound

   Suspectable Item : * Power Supply

   Check the Power Supply. If there is no trouble in the Power Supply, there must be two or more Blocks defective. Then proceed with the checking according to the following.

2. No Raster

   See first whether the Neon Lamp is lit.

   1) The Neon Lamp is OFF

      Suspectable Items : * Deflection Circuit Board
      * High Voltage Block

      a) Replace the Deflection Circuit Board.

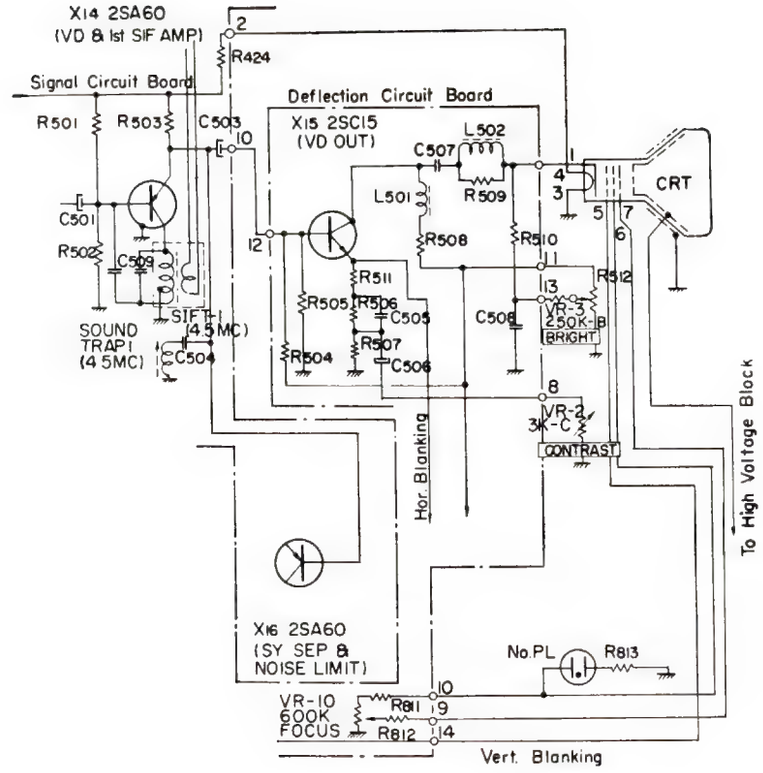
      b) If the Neon Lamp is not lit after a), replace the High Voltage Block.

   2) The Neon Lamp is lit.

      Suspectable Items : * High Voltage Block
      * Picture Tube
      * Brightness Control Circuit

      a) See whether the filament of the Picture Tube is ON. If the filament is OFF, check the Socket for the Picture Tube. The pins for the filament are Nos. 3 and 4

      b) If the filament is ON, the trouble is probably with the High Voltage Block. Before proceeding on to replace the High Voltage Block, see whether the cathode circuit of the Picture Tube (the Brightness Control Circuit) is all right.



(Fig. 44)

To do this, measure the cathode voltage (pin Y on the Deflection Circuit Board) from the copper side of the Deflection Circuit Board (refer to the Fig. 44). If this voltage is varied between 0 and 15 to 75 Volts by an adjustment of the Brightness Control, the cathode circuit is all right and the High Voltage Block is to be replaced.

c) If the voltage is abnormal, the Brightness Control Circuit on the Deflection Circuit Board must be checked.

d) If the Raster still does not appear after replacing the High Voltage Block, the Picture Tube may be defective.

CAUTION

NEVER ATTEMPT TO CHECK THE HIGH VOLTAGE (9 KV) CIRCUIT BY SPARK TEST.

The High Voltage is often tested by a Spark Test. But, in the Transistor TV, this is likely to cause damage not only to the Horizontal Deflection Circuit but also to other seemingly not related parts of the set. Especially, the High Voltage Spark will adversely affect the transistors on the Signal Circuit Board because of the Pulse AGC Circuit employed.

3. Raster appears but is abnormal

   First of all check the 12V DC Supply.

   1) Too small Raster

      Suspectable Item : * Deflection Circuit Board

      Replace the Deflection Circuit Board.

   2) Raster is dark.

      Suspectable Items : * Picture Tube
      * High Voltage Block

a) When the Raster size is normal but is not bright enough, the trouble is almost certainly with the Picture Tube.

b) When the Raster spreads out and gets dark while the Brightness is meant to be increased, the trouble is with the reduced emission of the High Voltage Rectifier Tube.

Video Output and Synchronization

1. No Picture (Sound is normal)

   Suspectable Items : * Deflection Circuit Board
   * Signal Circuit Board

   Check the Video Output Circuit Board as follows :

   Apply AC test voltage taken from the secondary winding of the Power Transformer through a 15KΩ Resistor and a 3μF, 500WV or more Electrolytic Capacitor, to the Terminal 12 (the Input terminal to the Video Output Circuit) of the Deflection Circuit Board as shown in the Fig. 45. If the AC hum appears on the Picture Tube, replace the Signal Circuit Board. If not, replace the Deflection Circuit Board.

2. Failure of Synchronization

   1) Failure of both Horizontal and Vertical Synchronization

      Suspectable Items : * Deflection Circuit Board
      * Signal Circuit Board

      Measure the voltage at the Terminal 11 of the Signal Circuit Board and decide whether the trouble is with the Signal Circuit Board or with the Deflection Circuit Board. The normal value of the voltage is around 2.5 Volts. If the voltage is more than 2.5 V, replace the Signal Circuit Board. If it is abnormally low, replace the Deflection Circuit Board.

   2) Failure of either Horizontal or Vertical Synchronization alone

      Suspectable Item : * Deflection Circuit Board

      In this case, replace the Deflection Circuit Board.

3. No Picture and No Sound

   Suspectable Items : * Tuner
   * Signal Circuit Board

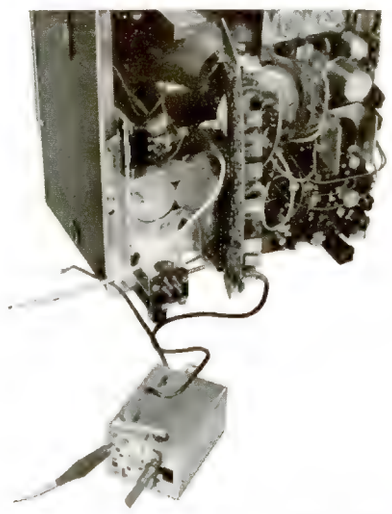
   a) Replace the Signal Circuit Board and see the result.

   b) Apply the output from another tuner to the input Terminal of the Signal Circuit Board as shown in the Fig. 45 and see the result. The power of this tuner is to be taken from the set with a length of cord with clips.

4. Only one or few Channels are defective

   Suspectable Items : * Tuner
   * Signal Circuit Board
   * Deflection Circuit Board

   For trouble like low contrast, poor signal to noise ratio and poor resolution, replace the Signal Circuit Board first. Then, if the signal to noise ratio is still poor, replace the Tuner. If the contrast is low, replace the Deflection Circuit Board.



(Fig. 45)

Sound (Picture is normal)

1. No Sound

   Suspectable Items : * Speaker
   * Signal Circuit Board

   Listen with the earphone.

   a) Check the Speaker and the Earphone Jack if sound is heard from the earphone.

   b) If still no sound can be heard, replace the Signal Circuit Board.

2. Sound is distorted.

   Suspectable Items : * Speaker
   * Signal Circuit Board

   Judge by hearing the sound whether the trouble is with the defective Speaker. If the trouble is not caused by the Speaker, replace the Signal Circuit Board.

3. Buzzing

   Suspectable Items : * Antenna
   * Fine Tuning
   * SIFT3
   * Signal Circuit Board

   a) If the Buzz appears only on some specific Channel, the trouble is not with the set itself. Adjust the Antenna and the Fine Tuning.

   b) If the Buzz appears on all Channels, adjust the Blue Core of SIFT3.

   c) Then, if the Buzz still exists, replace the Signal Circuit Board.

4. Other troubles with sound

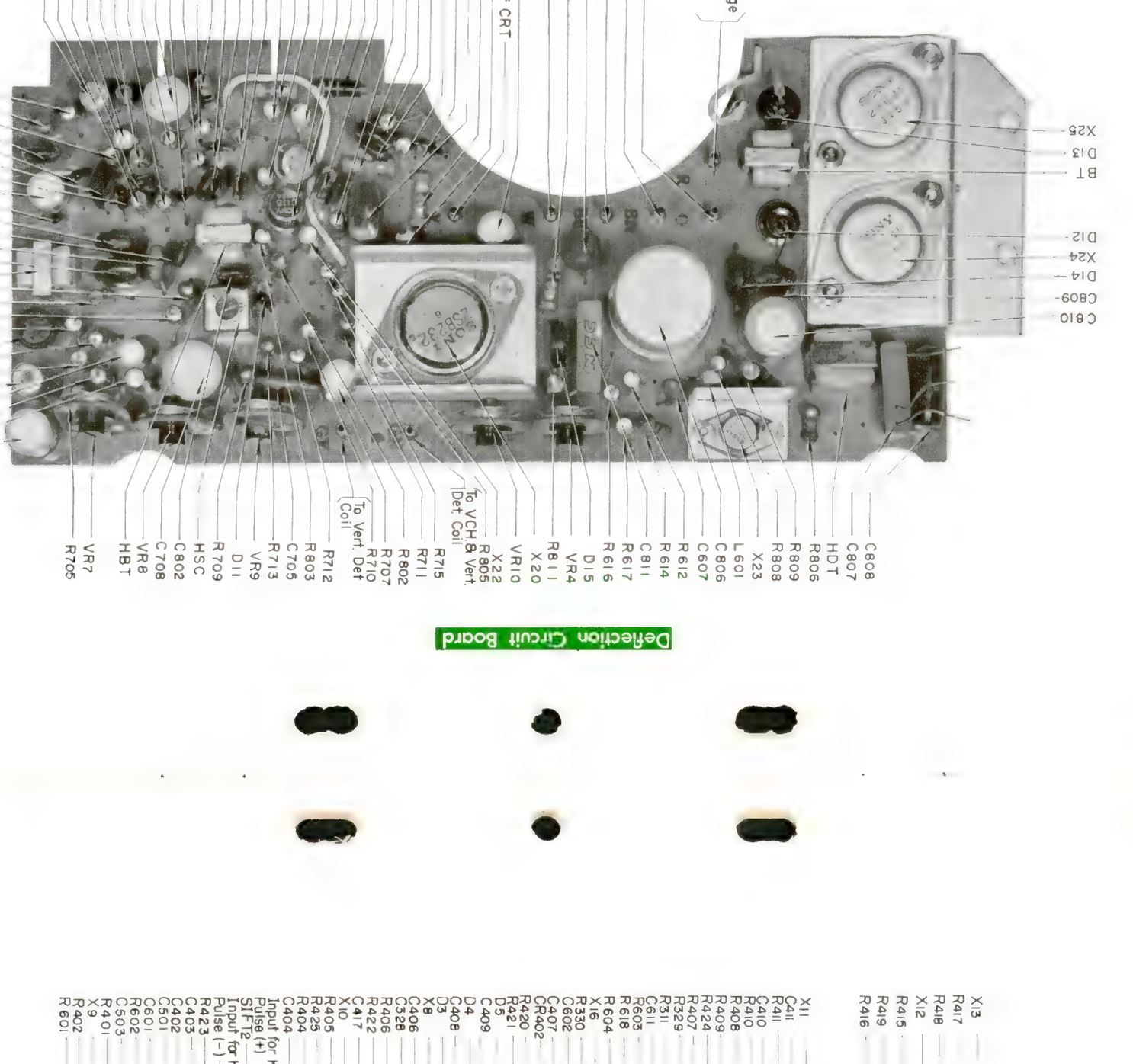
   Suspectable Item : * Signal Circuit Board

   For other troubles with the Sound, replace the Signal Circuit Board.

Adjustment of the Local Oscillator Frequency

Turn the screw type core of the Oscillator Coil in the Tuner. The Frequency increases as the core is turned clockwise.

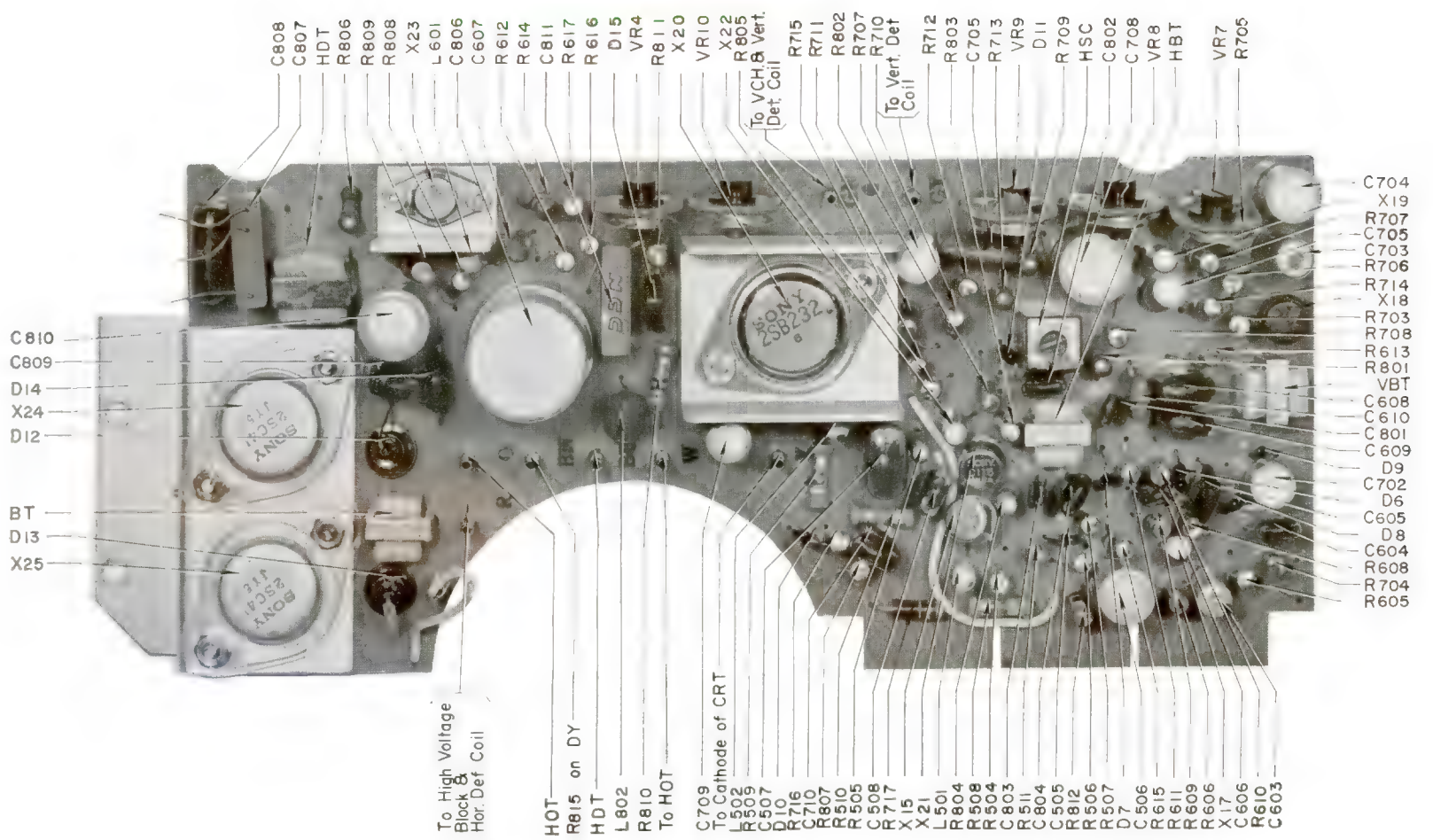
(Fig. 46)



Deflection Circuit Board

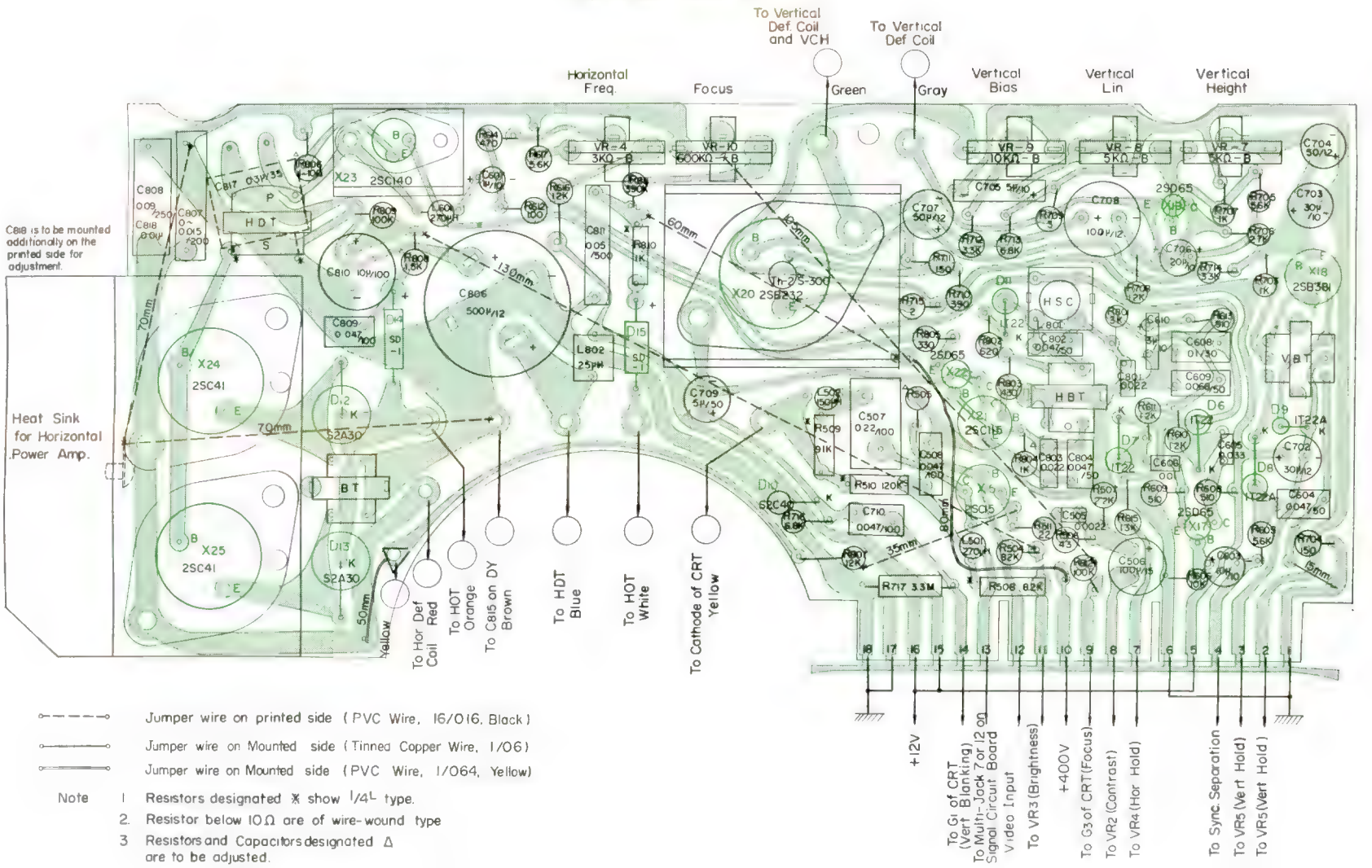
Signal Circuit Board

Deflection Circuit Board



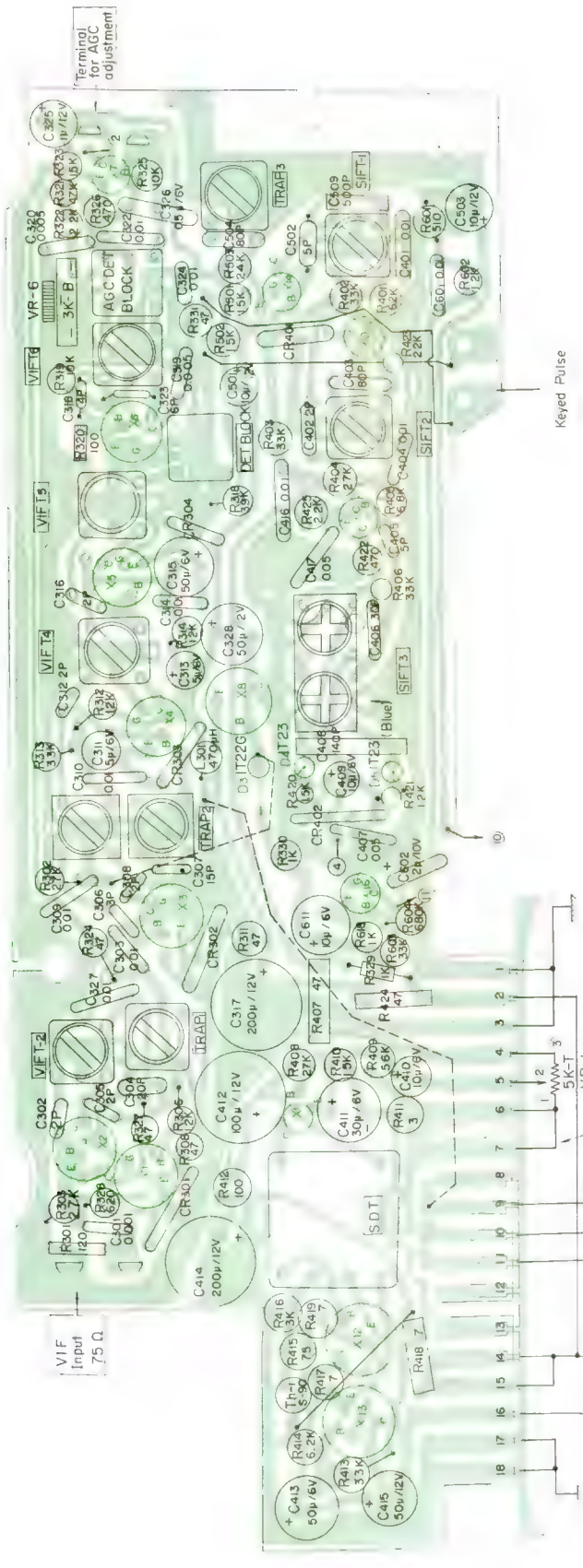
Mounting Diagram

— Deflection Circuit Board —



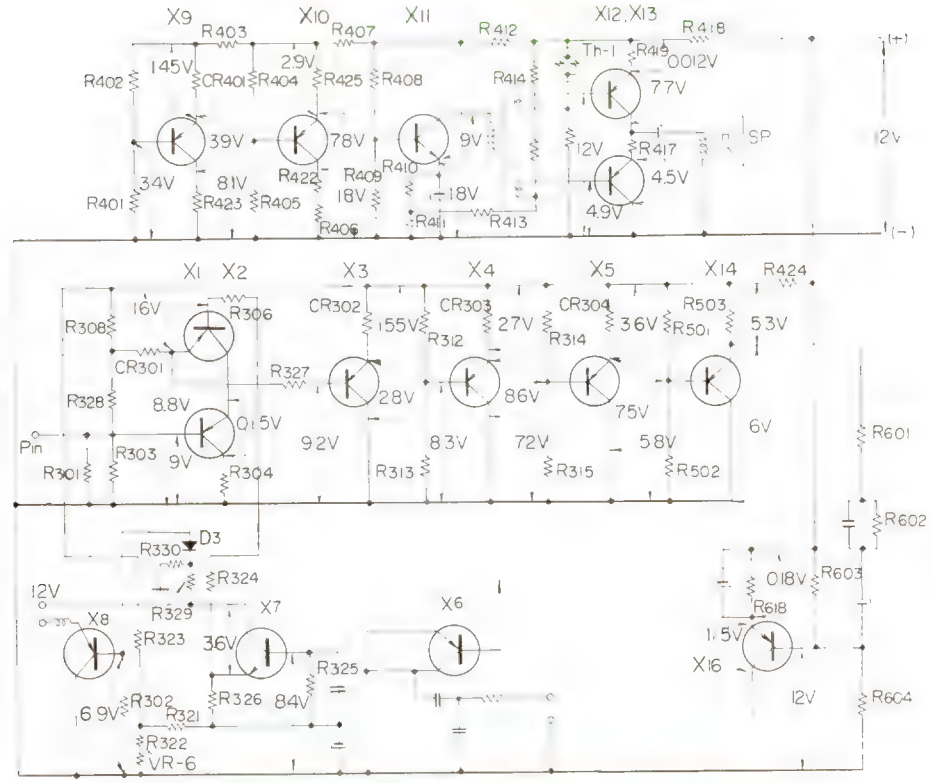
Mounting Diagram

—Signal Circuit Board—



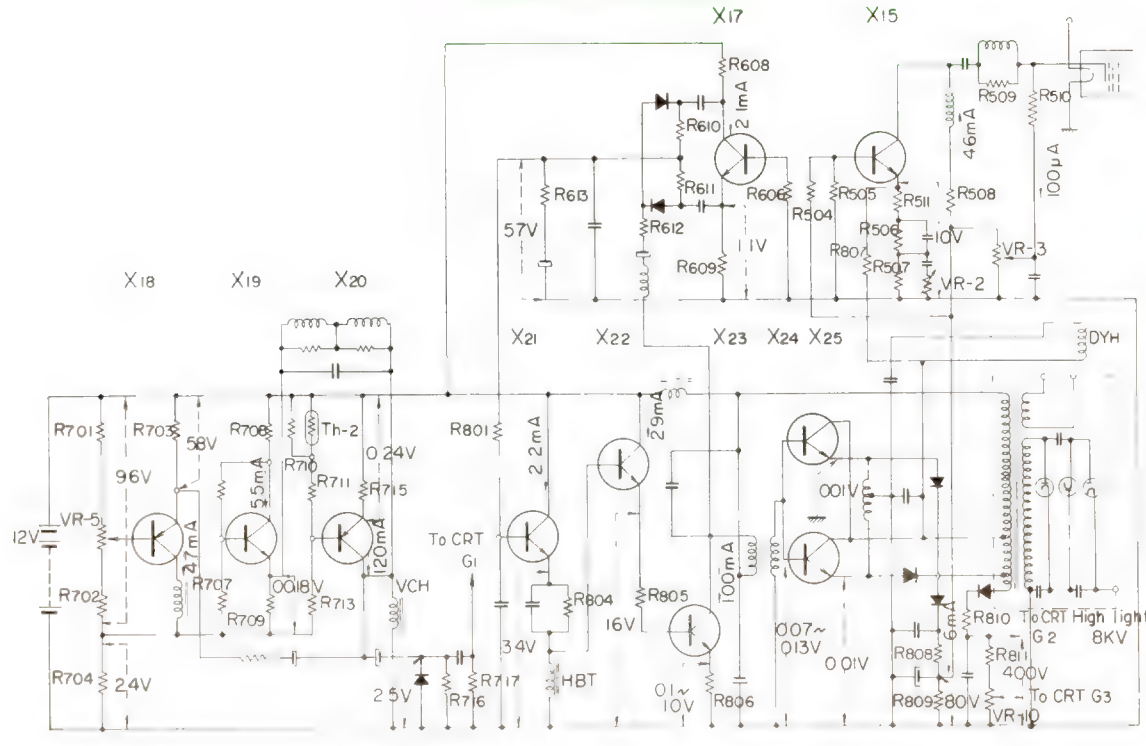
Voltage Distribution Chart

—Signal Circuit Board—



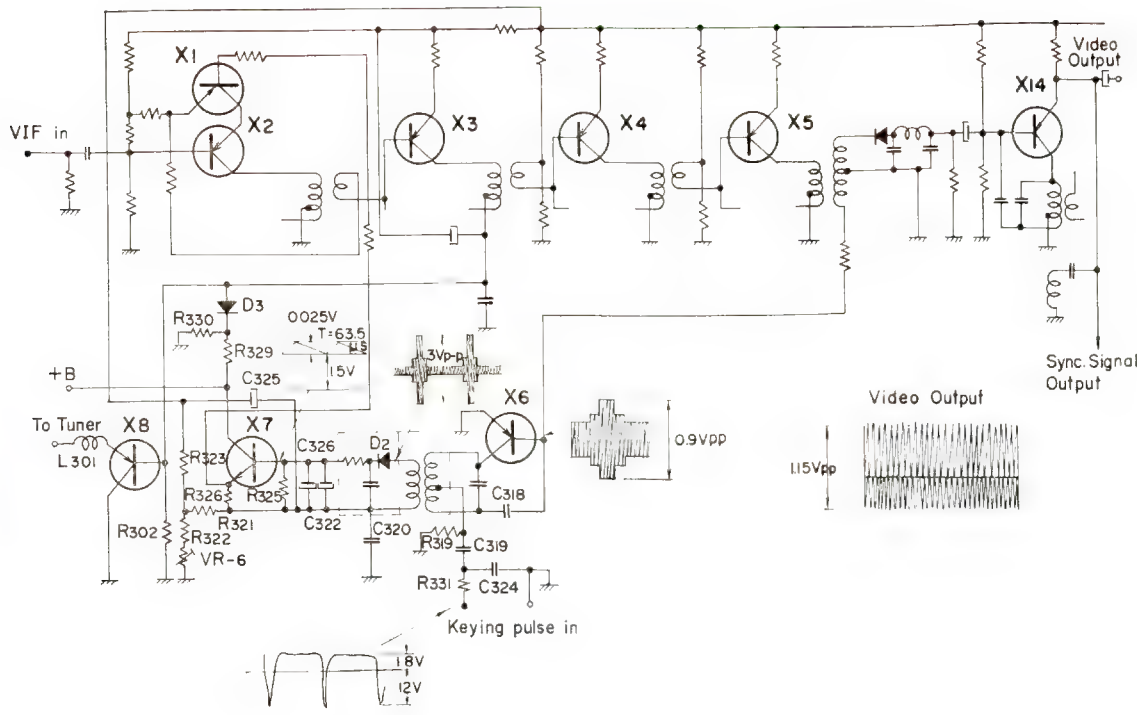
Voltage and Current Distribution Chart

—Deflection Circuit Board—



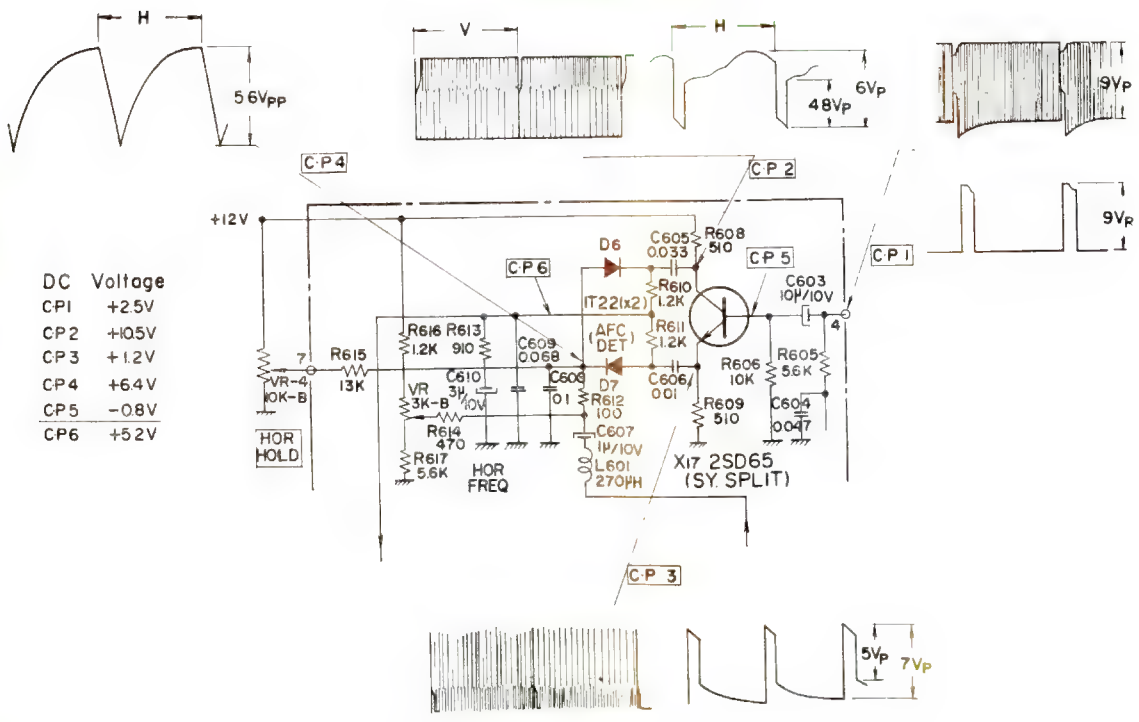
Wave Forms

-Pulse AGC Circuit—



Wave Forms

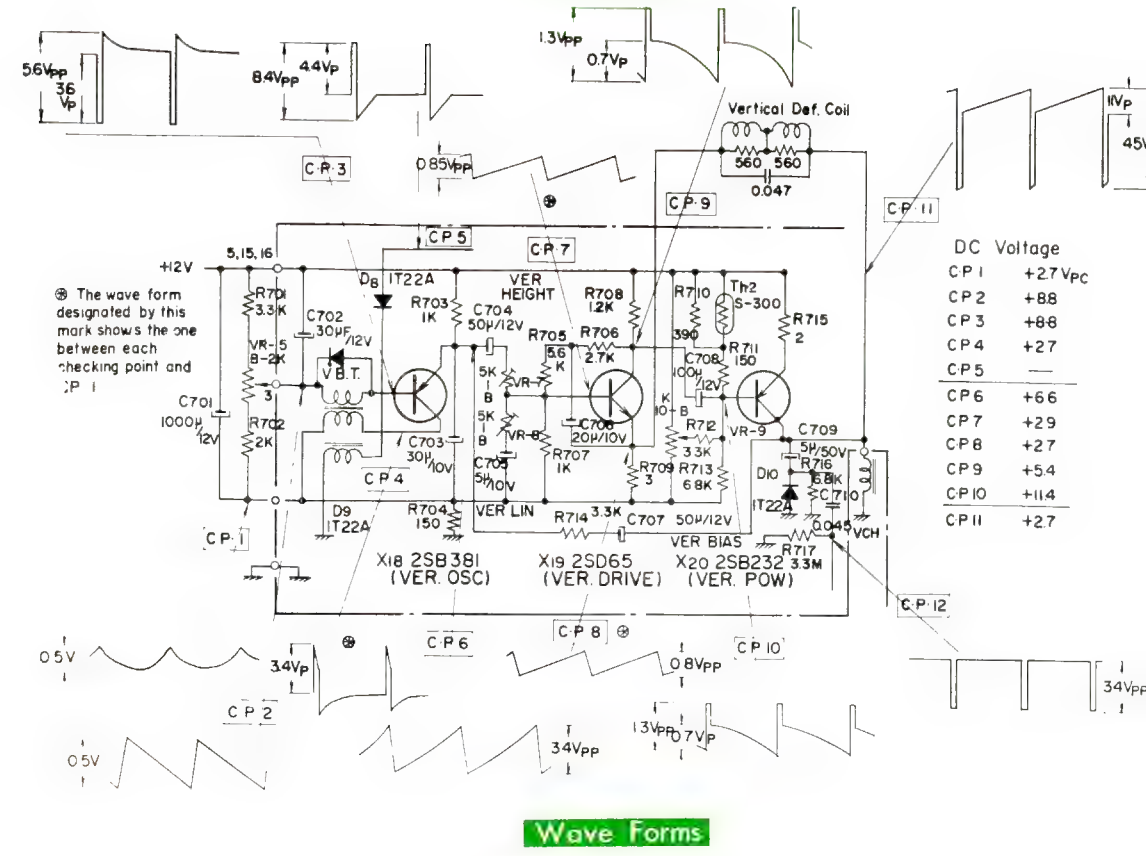
—AFC AMP.—



DC	Voltage
CP1	+2.5V
CP2	+10.5V
CP3	+1.2V
CP4	+6.4V
CP5	-0.8V
CP6	+5.2V

Wave Forms

--Ver. Def. Circuit

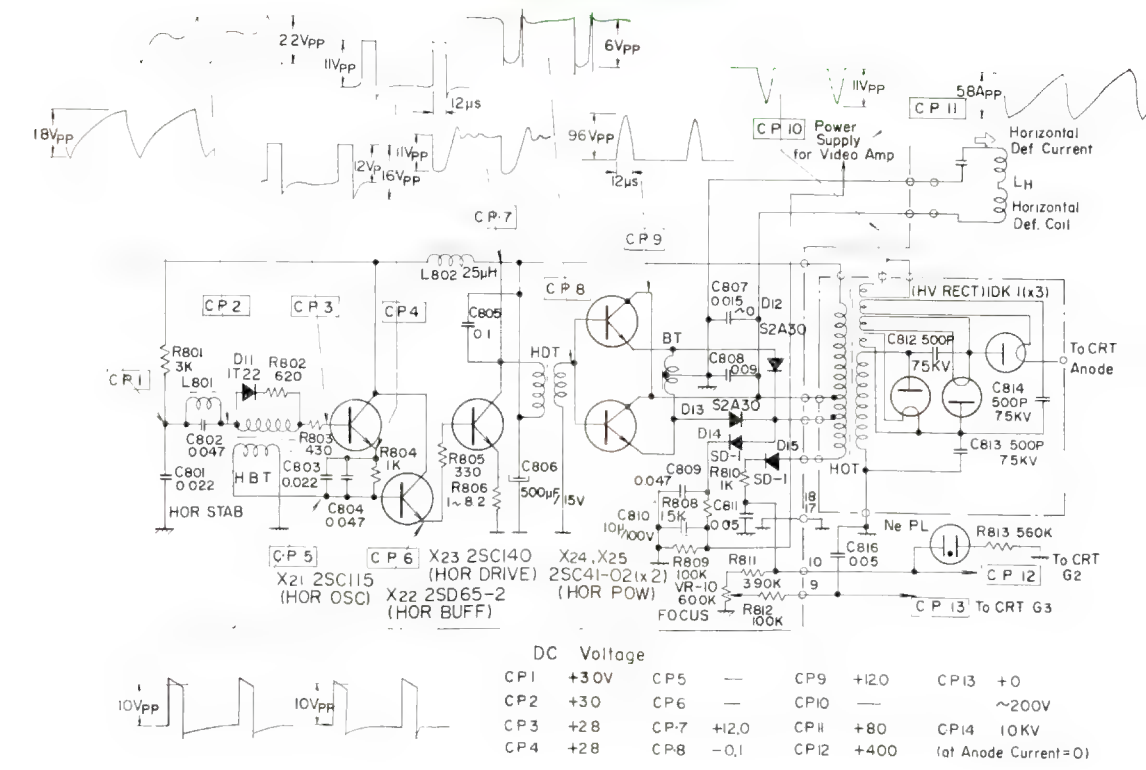


⊛ The wave form designated by this mark shows the one between each checking point and CP 1

DC	Voltage
CP1	+2.7 Vpc
CP2	+8.8
CP3	+8.8
CP4	+2.7
CP5	—
CP6	+6.6
CP7	+2.9
CP8	+2.7
CP9	+5.4
CP10	+11.4
CP11	+2.7

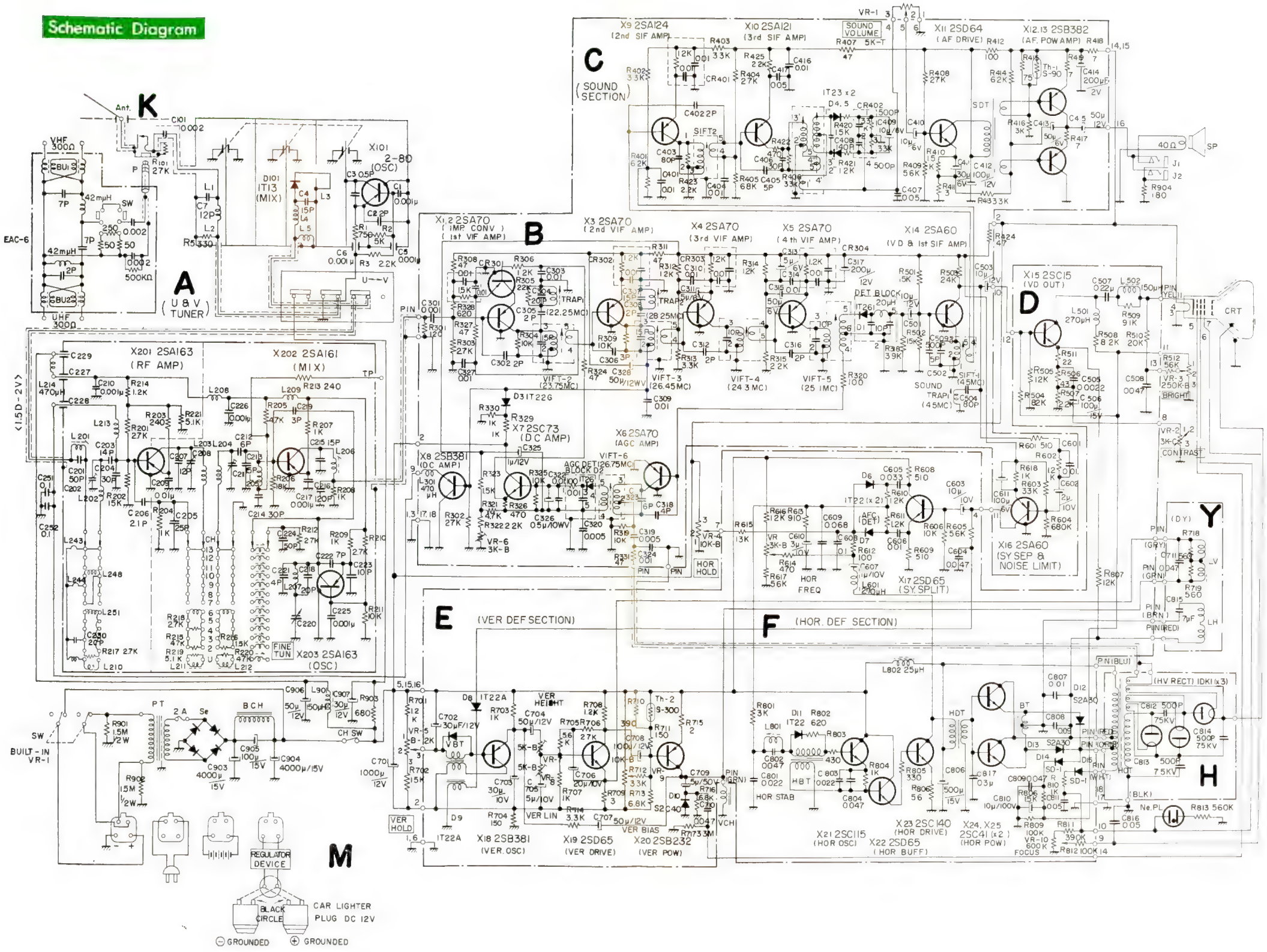
Wave Forms

-Hor. Def. Circuit—



DC	Voltage						
CP1	+30V	CP5	—	CP9	+12.0	CP13	+0
CP2	+30	CP6	—	CP10	—		~200V
CP3	+28	CP7	+12.0	CP11	+80	CP14	10KV
CP4	+28	CP8	-0.1	CP12	+400		(at Anode Current=0)

Schematic Diagram



Electrical Parts List (A)

Part No.	Symbol	Description
		Transistor
	X_{101}	2-80 (UHF OSC)
	X_{201}	2SA163 (VHF RF)
	X_{202}	2SA161 (VHF MIX)
	X_{203}	2SA163 (VHF OSC)
	X_1	2SA70 (Imp Conv)
	X_2	2SA70 (1st VIF Amp)
	X_3	2SA70 (2nd VIF Amp)
	X_4	2SA70 (3rd VIF Amp)
	X_5	2SA70 (4th VIF Amp)
	X_6	2SA70 (AGC Amp)
	X_7	2SC73 (DC Amp)
	X_8	2SB381 (DC Amp)
	X_9	2SA124 (2nd SIF Amp)
	X_{10}	2SA121 (3rd SIF Amp)
	X_{11}	2SD64 (AF Drive)
	X_{12}	2SB382 (AF Power Amp)
	X_{13}	2SB382 (AF Power Amp)
	X_{14}	2SA60 (Video Drive & 1st SIF Amp)
	X_{15}	2SC15 (Video Out)
	X_{16}	2SA60 (Sync Sep & Noise Limit)
	X_{17}	2SD65 (Sync Split)
	X_{18}	2SB381 (Ver Osc)
	X_{19}	2SD65 (Ver Drive)
	X_{20}	2SB382 (Ver Power)
	X_{21}	2SC115 (Hor Osc)
	X_{22}	2SD65 (Hor Buff)
	X_{23}	2SC140 (Hor Drive)
	X_{24}	2SC41 (Hor Power)
	X_{25}	2SC41 (Hor Power)
		Diode
	D_{101}	1T13 (UHF Mixer)
	D_1	1T261J (Built in Det Block)
	D_2	1T261J (Built in Det Block)
	D_3	1T22G
	D_4	1T23G
	D_5	1T23G
	D_6	1T22G
	D_7	1T22G
	D_8	1T22A
	D_9	1T22A
	D_{10}	S2C40
	D_{11}	1T22G
	D_{12}	S2A30
	D_{13}	S2A30
	D_{14}	SD-1LA
	D_{15}	SD-1LA
1-531-105-11	Se	Selenium Rectifier.
		Thermistor
8-690-003-00	Th_1	S-90
-005-00	Th_2	S-300
		Coil & Transformers
1-425-075-11	L_2	Coil
1-425-076-11	L_4	Coil
1-407-035-11	L_5	Choke Coil
1-409-027-11	L_{201}	IF Trap (A)
1-425-083-11	L_{202}	RF Coil (D)
1-425-049-11	L_{203}	RF Coil (A)
1-425-050-11	L_{204}	RF Coil (B)
1-409-028-11	L_{205}	IF Trap (B)
1-403-432-11	L_{206}	IF Trans.
1-425-104-11	L_{207}	Compensation Coil for Fine Tuning Capacitor
1-902-488-11	L_{208}	Poly-urethan Wire 36mm
1-902-489-11	L_{209}	Poly-urethan Wire 10mm
1-407-035-12	L_{213}	Micro Inductor
1-407-052-12	L_{214}	Micro Inductor

Part No.	Symbol	Description
1-902-601-11	L_{215}	Poly-urethan Wire 25mm
X-44026-41-1		Rotor Coil Ass'y
1-403-427-11	$VIFT_2$	Video IF Transformer (23.75 Mc)
1-403-428-11	$VIFT_3$	Video IF Transformer (26.45 Mc)
1-403-429-11	$VIFT_4$	Video IF Transformer (24.3 Mc)
1-403-430-11	$VIFT_5$	Video IF Transformer (25.1 Mc)
1-403-419-02	$VIFT_6$	Video IF Transformer (26.75 Mc)
1-403-314-11	$SIFT_1$	Sound IF Transformer
1-403-315-11	$SIFT_2$	Sound IF Transformer
1-403-313-11	$SIFT_3$	Sound IF Transformer (Detector)
1-403-420-02	Det	Video Detector Block
1-403-431-11	AGC Det	AGC Detector Block
1-409-022-11	$Trap_1$	Trap Coil (22.25 Mc)
1-409-023-11	$Trap_2$	Trap Coil (28.25 Mc)
1-409-024-11	Sound Trap	Sound Signal Trap Coil
1-423-067-11	SDT	Sound Driver Transformer
1-435-008-11	VBT	Vertical Blocking Transformer
1-435-007-12	HBT	Horizontal Blocking Transformer
1-437-002-00	HDT	Horizontal Driver Transformer
1-437-051-11	BT	Balance Transformer for Hor. Power
1-413-005-11	L_{801}	Stabilizing Coil for Hor. Sweep
1-421-013-11	L_{802}	Horizontal Choke Coil (25μH)
1-407-049-11	L_{501}	Micro Inductor (270μH)
1-407-030-11	L_{502}	Micro Inductor (150μH)
1-441-085-11	PT	Power Transformer
1-421-014-11	BCH	Filter Choke Coil for Power Supply
1-421-107-11	VCH	Vertical Output Choke Coil
1-407-052-11	L_{301}	Micro Inductor (470μH)
1-407-030-11	L_{901}	Micro Inductor (150μH)
1-513-188-12		Input Signal (UHF, VHF) Selector Switch.
		Potentiometer
1-221-388-12	VR_1	Volume Control 5 KΩ
1-221-386-11	VR_2	Contrast Control 3 KΩ
1-221-384-11	VR_3	Brightness Control 250 KΩ
1-221-385-11	VR_4	Horizontal Hold 10 KΩ
1-221-387-11	VR_5	Vertical Hold 2 KΩ
1-221-355-11	VR_6	AGC Setting 3 KΩ (Semi-fixed)
1-221-389-11	VR_7	Vertical Height 5 KΩ (Semi-fixed)
1-221-389-11	VR_8	Vertical Linearity 5 KΩ (Semi-fixed)
1-221-304-11	VR_9	Vertical Bias 10 KΩ (Semi-fixed)
1-221-391-11	VR_{10}	Focus Control 600 KΩ (Semi-fixed)
1-221-390-11	VR_{11}	Hor. Frequency 3 KΩ (Semi-fixed)
		Tube & Rectifiers
731270900	CRT	Picture Tube
1-525-039-00	HV Rect.	High Voltage Rectifier (1DK1)
		Encapsulated Component
1-101-537-11	CR_{301}	1.5 KΩ, 0.01μF, 0.01μF
1-101-406-01	CR_{302}	1.2 KΩ, 0.01μF, 0.01μF
1-101-406-01	CR_{303}	1.2 KΩ, 0.01μF, 0.01μF
1-101-406-01	CR_{304}	1.2 KΩ, 0.01μF, 0.01μF
1-101-406-01	CR_{401}	1.2 KΩ, 0.01μF, 0.01μF
1-101-536-11	CR_{432}	3.3 KΩ, 3.3 KΩ, 500pF, 500pF
		Resistor
1-204-156-00	R_1	750 Ω, RD1/16L, Carbon
1-203-977-00	R_2	5 KΩ, " "
1-203-184-00	R_3	2.2 KΩ, " "
	R_4	—deleted—
1-204-110-11	R_5	330 Ω, RD1/32L, Carbon
1-203-889-11	R_{101}	27 KΩ, RD1/16L "
1-204-103-11	R_{201}	2.7 KΩ, RD1/32SL, "
1-203-192-11	R_{202}	15 KΩ, RD1/16L, "
1-204-101-11	R_{203}	240 Ω, RD1/32SL, "
1-204-152-11	R_{204}	1 KΩ, " "

Part No.	Symbol	Description
1-204-104-11	R_{205}	4.7 KΩ, RD1/32SL, Carbon
1-203-193-11	R_{206}	18 KΩ, RD1/16L, 〃
1-204-102-11	R_{207}	1 KΩ, RD1/32SL, 〃
1-204-102-11	R_{208}	1 KΩ, 〃 〃
1-204-102-11	R_{209}	1 KΩ, 〃 〃
1-204-103-11	R_{210}	2.7 KΩ, 〃 〃
1-204-190-11	R_{211}	10 KΩ, RD1/16L, 〃
1-204-103-11	R_{212}	2.7 KΩ, RD1/32SL, 〃
1-204-041-11	R_{213}	240Ω, RD1/16L, 〃
1-204-853-11	R_{214}	1.2 KΩ, 〃 〃
1-204-104-11	R_{215}	4.7 KΩ, RD1/32SL, 〃
1-204-109-11	R_{216}	1.5 KΩ, 〃 〃
1-204-103-11	R_{217}	2.7 KΩ, 〃 〃
1-204-103-11	R_{218}	2.7 KΩ, 〃 〃
1-204-105-11	R_{219}	5.1 KΩ, 〃 〃
1-204-104-11	R_{220}	4.7 KΩ, 〃 〃
1-204-105-11	R_{221}	5.1 KΩ, 〃 〃
1-203-875-00	R_{301}	120Ω, RD1/16L, 〃
1-203-388-00	R_{302}	27 KΩ, RD1/8RL, 〃
1-203-372-00	R_{303}	2.7 KΩ, 〃 〃
1-203-190-00	R_{304}	10 KΩ, RD1/16L, 〃
1-203-891-00	R_{305}	22 KΩ, 〃 〃
1-203-368-00	R_{306}	1.2 KΩ, RD1/8RL, 〃
	R_{307}	—deleted—
1-203-414-00	R_{308}	47Ω, RD1/8RL, Carbon
1-203-190-00	R_{309}	10 KΩ, RD1/16L, 〃
	R_{310}	—deleted—
1-203-414-00	R_{311}	47Ω, RD1/8RL, 〃
1-203-368-00	R_{312}	1.2 KΩ, 〃 〃
1-203-373-00	R_{313}	3.3 KΩ, 〃 〃
1-203-368-00	R_{314}	1.2 KΩ, 〃 〃
1-203-370-00	R_{315}	2.2 KΩ, 〃 〃
	R_{316}	—deleted—
	R_{317}	—deleted—
1-203-878-00	R_{318}	3.9K Ω, RD1/16RL, 〃
1-203-383-00	R_{319}	10 KΩ, RD1/8RL, 〃
1-203-357-00	R_{320}	100Ω, 〃 〃
1-203-376-00	R_{321}	4.7 KΩ, 〃 〃
1-203-370-00	R_{322}	2.2 KΩ, 〃 〃
1-203-405-00	R_{323}	1.5 KΩ, 〃 〃
1-203-414-00	R_{324}	47Ω, 〃 〃
1-203-383-00	R_{325}	10 KΩ, 〃 〃
1-203-361-00	R_{326}	470Ω, 〃 〃
1-203-414-00	R_{327}	47Ω, 〃 〃
1-203-857-00	R_{328}	620Ω, 〃 〃
1-203-031-00	R_{329}	1 KΩ, RD1/4L, 〃
1-203-367-00	R_{330}	1 KΩ, RD1/8RL, 〃
1-203-414-00	R_{331}	47 KΩ, 〃 〃
1-203-380-00	R_{401}	6.2 KΩ, 〃 〃
1-203-373-00	R_{402}	3.3 KΩ, 〃 〃
1-203-373-00	R_{403}	3.3 KΩ, 〃 〃
1-203-372-00	R_{404}	2.7 KΩ, 〃 〃
1-203-381-00	R_{405}	6.8 KΩ, 〃 〃
1-203-634-00	R_{406}	33 KΩ, RD1/16RL, 〃
1-203-148-00	R_{407}	47Ω, RD1/4L, 〃
1-203-388-00	R_{408}	27K Ω, RD1/8RL, 〃
1-203-378-00	R_{409}	5.6 KΩ, 〃 〃
1-203-405-00	R_{410}	1.5 KΩ, 〃 〃
1-203-704-00	R_{411}	3Ω, 〃 〃
1-203-011-00	R_{412}	100Ω, RD1/4L, 〃
1-203-373-00	R_{413}	3.3 KΩ, RD1/8RL, 〃
1-203-380-00	R_{414}	6.2 KΩ, 〃 〃
1-203-356-00	R_{415}	75Ω, 〃 〃
1-203-443-00	R_{416}	3 KΩ, 〃 〃
1-203-461-00	R_{417}	7Ω, RD1/4L, 〃
1-203-462-11	R_{418}	7Ω, RD1/4L, Carbon
1-203-461-00	R_{419}	7Ω, RD1/8RL, 〃
1-203-422-00	R_{420}	1.5 KΩ, RD1/16RL, 〃
1-203-780-00	R_{421}	1.2 KΩ, 〃 〃
1-203-361-00	R_{422}	470Ω, 〃 〃
1-203-423-00	R_{423}	2.2 KΩ, 〃 〃
1-203-148-00	R_{424}	47Ω, RD1/4L, 〃
1-203-370-00	R_{425}	2.2 KΩ, RD1/8RL, 〃
1-203-386-00	R_{501}	15 KΩ, 〃 〃
1-203-386-00	R_{502}	15 KΩ, 〃 〃
1-203-778-00	R_{503}	2.4 KΩ, 〃 〃
1-203-397-00	R_{504}	82 KΩ, 〃 〃
1-203-408-00	R_{505}	18 KΩ, 〃 〃 (to be adjusted)
1-203-820-00	R_{506}	43Ω, 〃 〃
1-203-370-00	R_{507}	2.2 KΩ, 〃 〃
1-203-068-00	R_{508}	8.2 KΩ, RD1/4L, 〃
1-203-802-00	R_{509}	9.1 KΩ, RD1/8RL, 〃
1-203-123-00	R_{510}	120 KΩ, RD1/4L, 〃
1-203-352-00	R_{511}	22Ω, RD1/8RL, 〃
1-203-097-00	R_{512}	56 KΩ, RD1/4L, 〃
1-203-316-00	R_{601}	510Ω, RD1/8RL, 〃
1-203-368-00	R_{602}	1.2 KΩ, 〃 〃
1-203-390-00	R_{603}	33 KΩ, 〃 〃
1-203-326-00	R_{604}	680 KΩ, 〃 〃
1-203-378-00	R_{605}	5.6 KΩ, 〃 〃
1-203-383-00	R_{606}	10 KΩ, 〃 〃
	R_{607}	—deleted—
1-203-316-00	R_{608}	510Ω, RD1/8RL, Carbon
1-203-316-00	R_{609}	510Ω, 〃 〃
1-203-368-00	R_{610}	1.2 KΩ, 〃 〃
1-203-368-00	R_{611}	1.2 KΩ, 〃 〃
1-203-357-00	R_{612}	100Ω, 〃 〃
1-203-761-00	R_{613}	910Ω, 〃 〃
1-203-361-00	R_{614}	470Ω, 〃 〃
1-203-383-00	R_{615}	10 KΩ, 〃 〃
1-203-368-00	R_{616}	1.2 KΩ, 〃 〃
1-203-378-00	R_{617}	5.6 KΩ, 〃 〃
1-203-367-00	R_{618}	1 KΩ, 〃 〃
1-203-701-00	R_{701}	1.2 KΩ, RD1/4L, 〃
1-203-039-00	R_{702}	1.5 KΩ, 〃 〃
1-203-367-00	R_{703}	1 KΩ, RD1/8RL, 〃
1-203-415-00	R_{704}	150Ω, 〃 〃
1-203-378-00	R_{705}	5.6 KΩ, 〃 〃
1-203-372-00	R_{706}	2.7 KΩ, 〃 〃
1-203-367-00	R_{707}	1 KΩ, 〃 〃
1-203-368-00	R_{708}	1.2 KΩ, 〃 〃
1-207-019-00	R_{709}	3Ω, RW1/4RL, Wire Wound
1-203-412-00	R_{710}	390Ω, RD1/8RL, Carbon
1-203-415-00	R_{711}	150Ω, 〃 〃
1-203-373-00	R_{712}	3.3 KΩ, 〃 〃
1-203-381-00	R_{713}	6.8 KΩ, 〃 〃
1-203-373-00	R_{714}	3.3 KΩ, 〃 〃
1-207-014-00	R_{715}	2Ω, RW1/4RL, Wire Wound
1-203-381-00	R_{716}	6.8 KΩ, RD1/8RL, Carbon
1-201-596-00	R_{717}	3.3 MΩ, RC1/2L, Composition
1-203-363-00	R_{718}	560Ω, RD1/8RL, Carbon
1-203-363-00	R_{719}	560Ω, 〃 〃
1-203-443-00	R_{801}	3 KΩ, 〃 〃
1-203-857-00	R_{802}	620Ω 〃 〃
1-203-760-00	R_{803}	430Ω, 〃 〃
1-203-367-00	R_{804}	1 KΩ, 〃 〃
1-203-360-00	R_{805}	330Ω, 〃 〃
1-207-019-00	R_{806}	1～8.2Ω, RW1/4RL, Wire Wound (to be adjusted)

Part No.	Symbol	Description
1-203-384-00	R_{807}	12 KΩ, RD1/8RL, Carbon
1-203-405-00	R_{808}	1.5 KΩ, 〃 〃
1-203-399-00	R_{809}	100 KΩ, 〃 〃
1-203-031-00	R_{810}	1 KΩ, RD1/4L, 〃
1-203-867-00	R_{811}	390 KΩ, RD1/8RL, 〃
1-203-399-00	R_{812}	100 KΩ, 〃 〃
1-203-464-11	R_{813}	560 KΩ, RD1/4L, 〃
1-201-455-00	R_{901}	1.5 MΩ, RC1/2L, Composition
1-201-455-00	R_{902}	1.5 MΩ, 〃 〃
1-203-157-00	R_{903}	680Ω, RD1/4L, Carbon
1-203-334-00	R_{904}	180Ω, 〃 〃
1-203-129-00	R_{905}	27 KΩ, 〃 〃
		Capacitor
1-101-125-14	C_1	1,000pF Ceramic
1-101-010-11	C_2	2pF 〃
1-101-076-11	C_3	0.5pF 〃
1-101-532-11	C_4	15pF 〃 (Disc)
1-101-531-11	C_5	1,000pF 〃
1-101-531-11	C_6	1,000pF 〃
1-101-130-11	C_7	12p 〃
1-101-002-12	C_{101}	0.002μF 50WV 〃
1-101-562-11	C_{201}	50pF 〃
1-141-060-11	C_{202}	Cylindrical Trimmer Capacitor
1-101-575-11	C_{203}	14pF Ceramic
1-101-561-11	C_{204}	30pF 〃
1-101-565-11	C_{205}	25pF 〃
1-101-568-11	C_{206}	1pF 〃
1-101-569-11	C_{207}	12pF 〃
1-141-060-11	C_{208}	Cylindrical Trimmer Capacitor
1-101-072-14	C_{209}	0.01μF Ceramic
1-101-125-11	C_{210}	0.001μF 〃
1-141-060-11	C_{211}	Cylindrical Trimmer Capacitor
1-101-556-11	C_{212}	6pF Ceramic
1-101-559-11	C_{213}	15pF 〃
1-101-561-11	C_{214}	30pF 〃
1-101-559-11	C_{215}	15pF 〃
1-101-573-11	C_{216}	120pF 〃
1-101-125-11	C_{217}	0.001μF 〃
1-101-560-11	C_{218}	20pF 〃
1-101-553-11	C_{219}	3pF 〃
	C_{220}	Fine Tuning Capacitor
1-101-554-11	C_{221}	4pF Ceramic
1-101-572-11	C_{222}	7pF 〃
1-101-557-11	C_{223}	10pF 〃
1-101-563-11	C_{224}	50pF 〃
1-101-125-11	C_{225}	0.001μF 〃
1-101-125-11	C_{226}	0.001μF 〃
1-101-544-11	C_{227}	1,800pF 〃
1-101-544-11	C_{228}	1,800pF 〃
1-101-544-11	C_{229}	1,800pF 〃
1-101-560-11	C_{230}	20pF 〃
1-101-555-11	C_{231}	5pF 〃
1-101-561-11	C_{232}	30pF 〃
1-101-086-01	C_{251}	0.1μF 50WV 〃
1-101-086-01	C_{252}	0.1μF 50WV 〃
1-101-001-11	C_{301}	0.001μF 50WV 〃
1-101-010-11	C_{302}	2pF 〃
1-101-004-11	C_{303}	0.01μF 50WV 〃
1-101-111-18	C_{304}	20pF 〃
1-101-010-11	C_{305}	2pF 〃
1-101-011-11	C_{306}	3pF 〃
1-101-114-17	C_{307}	15pF 〃
1-101-010-11	C_{308}	2pF 〃
1-101-004-11	C_{309}	0.01μF 50WV 〃
1-101-004-11	C_{310}	0.01μF 50WV 〃
1-121-106-11	C_{311}	5μF 6WV Electrolytic
1-101-010-11	C_{312}	2pF Ceramic
1-121-106-01	C_{313}	5μF 6WV Electrolytic
1-101-004-01	C_{314}	0.01μF 50WV Ceramic
1-121-135-01	C_{315}	50μF 6WV Electrolytic
1-101-010-11	C_{316}	2pF Ceramic
1-121-121-01	C_{317}	200μF 12WV Electrolytic
1-101-048-11	C_{318}	4pF Ceramic
1-101-058-01	C_{319}	5,000pF 50WV 〃
1-101-058-01	C_{320}	5,000pF 50WV 〃
	C_{321}	—deleted—
1-101-004-11	C_{322}	0.001μF 50WV Ceramic
1-103-096-11	C_{323}	6pF Styrol
1-101-004-11	C_{324}	0.01μF 50WV Ceramic
1-121-116-01	C_{325}	1μF 12WV Electrolytic
1-127-911-11	C_{326}	0.5μF 10WV 〃 (Alox)
1-101-004-11	C_{327}	0.01μF 50WV Ceramic
1-121-122-01	C_{328}	50μF 12WV Electrolytic
1-121-145-01	C_{329}	1μF 5WV 〃
1-101-004-11	C_{401}	0.01μF 50WV Ceramic
1-101-010-11	C_{402}	2pF 〃
1-101-113-18	C_{403}	80pF 〃
1-101-004-11	C_{304}	0.01μF 50WV 〃
1-101-012-11	C_{405}	5pF 〃
1-101-115-17	C_{406}	30pF 〃
1-101-007-11	C_{407}	0.05μF 50WV 〃
1-101-740-17	C_{408}	140pF 〃 (Disc)
1-121-104-01	C_{409}	10μF 6WV Electrolytic
1-121-104-01	C_{410}	10μF 6WV 〃
1-121-102-01	C_{411}	30μF 6WV 〃
1-121-120-01	C_{412}	100μF 12WV 〃
1-121-135-01	C_{413}	50μF 6WV 〃
1-121-121-01	C_{414}	200μF 12WV 〃
1-121-122-01	C_{415}	50μF 12WV 〃
1-101-004-11	C_{416}	0.01μF 50WV 〃
1-101-007-11	C_{417}	0.05μF 50WV 〃
1-121-118-01	C_{501}	10μF 12WV Electrolytic
1-101-012-11	C_{502}	5pF Ceramic
1-121-118-01	C_{503}	10μF 12WV Electrolytic
1-101-113-12	C_{504}	80pF Ceramic
1-105-665-12	C_{505}	0.0022μF 50WV Mylar
1-121-201-05	C_{506}	100μF 15WV Electrolytic
1-105-889-12	C_{507}	0.22μF 100WV Mylar
1-105-721-12	C_{508}	0.047μF 100WV 〃
1-103-305-11	C_{509}	500pF Styrol
1-105-673-12	C_{601}	0.01μF 50WV Mylar
1-127-913-11	C_{602}	2μF 10WV Electrolytic (Alox)
1-121-052-08	C_{603}	10μF 10WV 〃
1-105-681-12	C_{604}	0.047μF 50WV Mylar
1-105-669-12	C_{605}	0.033μF 50WV 〃
1-105-673-12	C_{606}	0.01μF 50WV Ceramic
1-127-906-00	C_{607}	1μF 10WV Electrolytic
1-105-685-12	C_{608}	0.1μF 50WV Mylar
1-105-683-12	C_{609}	0.068μF 50WV 〃
1-127-908-00	C_{610}	3μF 10WV Electrolytic (Alox)
1-121-051-08	C_{611}	100μF 6WV 〃
1-121-021-11	C_{701}	1,000μF 12WV 〃
1-121-119-01	C_{702}	30μF 12WV 〃
1-131-008-11	C_{703}	30μF 10WV 〃 (Tantalum)
1-121-188-05	C_{704}	50μF 12WV 〃
1-127-921-11	C_{705}	5μF 10WV 〃 (Alox)
1-121-127-01	C_{706}	20μF 10WV 〃
1-121-122-01	C_{707}	50μF 12WV 〃
1-121-120-01	C_{708}	100μF 12WV 〃
1-121-142-01	C_{709}	5μF 50WV 〃

Part No.	Symbol	Description	Part No.	Symbol	Description
1-105-721-12	C_{710}	0.047μF 100WV Mylar	1-101-539-11	C_{812}	500pF 7.5 KV Ceramic
1-105-721-11	C_{711}	0.047μF 〃 〃	1-101-539-11	C_{813}	500pF 7.5 KV 〃
1-105-677-12	C_{801}	0.022μF 50WV 〃	1-101-539-11	C_{814}	500pF 7.5 KV 〃
1-105-681-12	C_{802}	0.047μF 〃 〃	1-105-278-11	C_{815}	7μF 50WV Mylar (Metalized)
1-105-669-12	C_{803}	0.033μF 〃 〃	1-113-122-11	C_{816}	0.05μF 500WV PS Capacitor
1-105-681-12	C_{804}	0.047μF 〃 〃	1-105-097-00	C_{817}	0.3μF 35WV Mylar
	C_{805}	—deleted—	1-105-167-11	C_{818}	0.01μF 200WV 〃
1-121-197-01	C_{806}	500μF 15WV Electrolytic	1-109-010-11	C_{901}	200pF Mica
1-105-274-11	C_{807}	0.01μF+0.005μF 200WV Mylar (Block)	1-109-010-11	C_{902}	200pF 〃
			1-119-071-01	C_{903}	4,000μF 15WV Electrolytic
1-105-273-11	C_{808}	0.09μF 250WV 〃	1-119-071-01	C_{904}	4,000μF 15WV 〃
1-105-721-12	C_{809}	0.047μF 〃	1-119-106-11	C_{905}	100μF 15WV 〃
1-121-126-00	C_{810}	10μF 100WV Electrolytic	1-119-042-01	C_{906}	50μF 12WV 〃
1-113-122-11	C_{811}	0.05μF 500WV PS Capacitor	1-119-044-01	C_{907}	30μF 12WV 〃

Electrical Parts List (B)

Part No.	Description	Qt'y	Part No.	Description	Q'ty
	A. General			**B. Wire & Miscellaneous** (Minimum q'ty for ordering : Meter)	
	Cabinet & Appearance Items			**Main Block**	
1-507-030-10	Earphone Jack	1		P. V. C. Wire	mm
1-514-107-11	Battery Charger Switch	1		26/0.16 Brown	1380
1-502-089-11	Speaker	1		〃 Black	275
4-003-301-01	Speaker Grommet	4		〃 Red	230
X-40032-84-2	Antenna Jack Ass'y	1		16/0.16 Black	935
	Main Block			〃 White	985
1-526-052-04	Picture Tube Socket	1		〃 Purple	40
1-545-002-11	Multi-Jack	2		〃 Gray	265
1-533-016-11	Fuse Holder	1		〃 Green	205
1-506-050-11	4 P Plug	1		〃 Orange	460
1-536-052-11	Terminal Strip	1		〃 Brown	225
1-532-035-11	Fuse (2A)	1		〃 Yellow	540
1-519-007-15	Neon Lamp	1		〃 Blue	270
1-536-054-11	Terminal Strip 1-1P	1		26/0.16 Blue	100
	Accessory			Two Conductor Microphone Cord 7/0.12	35
X-40032-32-1	Accessory Ass'y, including	1		Tinned Copper Wire	
1-534-041-20	AC Cord	(1)	7-611-031-61	0.6φ	205
1-534-042-21	Extension Cord	(1)		**Video & Sound Signal Block**	
1-504-010-02	Earphone	(1)		P. V. C Wire	
X-44017-31-1	External Antenna Connector EAC-6	1		16/0.16 Black	612
	Deflection Block			**Deflection Block**	
1-538-137-12	Deflection Circuit Board	1		P. V. C. Wire	
1-506-108-00	Connecting Pin	9		16/0.16 Black	470
1-507-109-00	Connector Tip	1		〃 Yellow	130
	Video & Sound Signal Block			Tinned Copper Wire 0.6φ	15
1-538-136-12	Video & Sound Signal Circuit Board	1		**High Voltage Block**	
1-506-108-00	Connecting Pin	3	1-904-042-11	Polyethylene Wire 4.2φ	20
1-507-109-00	Connector Tip	1	1-902-490-11	Advance Wire	465
				Deflection Yoke	
				P. V. C. Wire	
				26/0.16 Brown	12
				〃 Red	12
				10/0.16 Green	17
				〃 Gray	17

Part No.	Description	Q'ty	Part No.	Description	Q'ty
BT-501	Tuner, Block (including UHF and VHF)	1	1-453-002-12	High Voltage Block	1
X-40032-52-1	Video & Sound Signal Block (Mounted)	1	1-451-005-13	Deflection Yoke	1
-53-1	Deflection Block (Mounted)	1			

Mechanical Parts List

Part No.	Description	Q'ty	Part No.	Description	Q'ty
	A. General		4-003-348-01	Front Cover Badge (UW)	(1)
	Cabinet & Appearance Items		4-003-239-01	Adjustment Hole Cover	1
X-40032-02-2	Picture Tube Mask Assembly, including	1	-240-01	Bottom Cover	1
4-003-204-02	Picture Tube Mask	(1)	-241-01	Circuit Board Holding Bracket	1
-205-01	" SONY " Badge	(1)	X-40032-08-3	Table Stand Assembly, including	2
-206-01	Picture Tube Fixing Bracket (left)	(2)	4-003-242-03	Table Stand	(2)
-207-01	〃 (right)	(2)	-243-02	Reinforcing Plate for Table Stand	(2)
X-40032-03-1	Control Panel Assembly, including	1	X-40032-09-1	Back Cover (UW) Assembly, including	1
4-003-208-01	Control Panel Mounter	(1)	4-003-244-03	Back Cover	(1)
-209-01	Control Panel	(1)	-245-02	Name Plate (UW)	(1)
-210-01	Dial Ring (inside)	(1)	4-002-816-01	Badge No. Label	1/10
-211-01	Dial Ring	(1)	X-40032-10-2	Channel Selector Knob (UW) Assembly, including	1
-212-01	Dial Cover	(1)	4-003-246-01	Channel Selector Knob (UW)	(1)
-213-01	Control Panel Mounter Holding Bracket	(2)	-247-01	Channel Selector Indicating Plate (UW)	(1)
4-003-214-01	Picture Tube Protector	1	-248-01	Channel Selector Knob Spring (UW)	(1)
-215-02	Dust-proof Rubber	1	-023-01	Channel Selector Knob Cushion	(1)
-216-02	Picture Tube Holding Ring	1	X-40032-12-1	Fine Tuning Knob (UW) Assembly, including	1
X-40032-04-1	Picture Tube Holding Bracket Assembly, including	4	4-003-249-02	Fine Tuning Knob (UW)	(1)
4-003-217-01	Picture Tube Holding Bracket	(4)	-250-01	Fine Tuning Knob Spring	(1)
-218-01	Cushion for Picture Tube Holding Bracket	(4)	X-40032-13-1	Control Knob Assembly, including	4
4-003-219-01	Cushion for Picture Tube	1	4-003-251-01	Control Knob	(4)
-220-02	Grounding Spring	1	-252-01	Control Knob Spring	(4)
X-40032-05-1	Cabinet Assembly	1	X-40032-14-1	Volume Control Knob Assembly, including	1
X-40032-06-3	Grip Handle Assembly, including	1	4-003-253-01	Volume Control Knob	(1)
4-003-223-02	Grip Handle	(1)	-254-01	Volume Control Knob Panel	(1)
-224-02	Ornamental Leather for Grip Handle	(1)	-252-01	Volume Control Knob Spring	(1)
-227-03	Felt for Grip Handle	(2)	4-003-345-01	Packing for Volume Control Knob	5
4-003-233-01	Grip Handle Receptacle	2		**Main Block**	
-225-01	Grip Handle Bearing (left)	1	X-40032-15-1	Chassis Assembly, including	1
-226-01	〃 (right)	1	4-003-256-01	Chassis	(1)
-228-01	Speaker Grille	4	-257-01	Adjustable Clamp for Electrolytic Capacitor (large)	(1)
-329-02	Speaker Holding Nut	4	4-003-259-01	Multi-Jack Holding Bracket	1
X-40032-83-2	Telescopic Antenna Assembly, including	1	-260-02	Adjustable Clamp for Electrolytic Capacitor (small)	1
X-40026-71-1	Telescopic Antenna Sub-Assembly	(1)	-261-01	Volume Control Holding Plate	1
4-002-840-01	Telescopic Antenna Ball	(1)	-292-01	Tuner Holding Bracket	1
-841-01	Telescopic Antenna Ball Receptacle	(1)	-293-01	Pilot Lamp Holder	1
-842-01	Telescopic Antenna Spring	(1)		**Video & Sound Signal Block**	
-843-01	Special Washer	(2)	4-003-330-02	Shielded Plate for Video & Sound Signal Circuit Board	1
-844-01	Telescopic Antenna Supporter	(1)	-344-02	Rubber Bushing for Video & Sound Signal Circuit Board	2
-845-01	Telescopic Antenna Fixing Shaft	(1)		**Deflection Block**	
-717-00	Telescopic Antenna Bottom Insulator	(1)	X-40032-01-1	Deflection Circuit Board Assembly (not printed), including	1
4-003-343-02	Telescopic Antenna Holding Plate	(1)	4-003-201-01	Heat Sink for Hor. Power Transistor	(1)
-232-03	Telescopic Antenna Washer	(1)	-202-01	Heat Sink for Vert. Power Transistor	(1)
-334-01	Telescopic Antenna Lug	(1)	-203-01	Spacer for Heat Sink	(1)
7-623-112-11	Washer 5φ (medium)	(1)	4-002-107-01	Heat Sink for Hor. Driver Transistor	(1)
-412-02	Star Washer 5φ	(1)		**Accessory**	
4-002-727-00	Telescopic Antenna Holding Nut 5φ	(1)	4-003-277-01	Styro-Foam Cushion (left)	1
-728-00	Lock Nut for Telescopic Antenna 5φ	(1)	-278-01	〃 (right)	1
-764-01	Antenna Tip	(1)	-358-01	Master Carton (for 2 sets)	1/2
4-003-342-01	Telescopic Antenna Bushing	1			
-346-01	Telescopic Antenna Clamper	1			
X-40032-98-1	Front Cover (UW) Assembly, including	1			
4-003-347-01	Front Cover	(1)			

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Part No.	Description	Q'ty
4-003-279-01	Carton for Cabinet	1
4-002-770-00	Polyethylene Bag	1
4-495-025-11	Instruction Manual	1
X-44900-02-1	Silicone Cloth (in Polyethylene Bag)	1
4-490-012-00	Polyethylene Bag	(1)
3-998-911-01	Silicone Cloth	(1)
X-40032-96-1	Caution Tag Assembly, including	1
4-003-408-01	Caution Card	(1)
4-498-002-10	Adjust Card	(1)
4-003-284-01	Inspection Card	(1)
	B. Screw & Washer	
	(Minimum q'ty for ordering : 100pcs.)	
	Cabinet & Appearance Items	
	Screw	
7-621-559-69	⊕K 2.6φ×10 (for Telescopic Antenna Clamper)	1
-770-39	⊕B 3φ×8 (for Picture Tube Mask (4), Control Panel Mounter (2))	6
-261-52	⊕P 3φ×8 (for Chassis)	2
-770-40	⊕B 3φ×10 (for Speaker)	4
-261-42	⊕P 3φ×6 (for Deflection Circuit Board (1), Picture Tube (4), Table Stand (2), Telescopic Antenna (2))	9
-770-26	⊕B 2.6φ×6 (for External Antenna Jack)	1
-263-02	⊕P 3φ×50 (for Picture Tube)	1
	Self Tapping Screw	
7-621-722-51	⊕R 3φ×8 (for Chassis (2), Circuit Board Holding Bracket (1), Deflection Circuit Board (2), Bottom Cover (4))	9
-61	⊕R 3φ×10 (for Table Stand)	4
-71	⊕R 3φ×12 (for Bottom Cover)	5
	Star Washer	
7-623-407-01	2.6φ (for Telescopic Antenna Clamer)	1
-413-01	6φ (for Grip Handle)	2
	Washer	
7-623-108-11	3φ (medium) (for Back Cover (5), Picture Tube (1))	6
	Spring Washer	
7-623-208-21	3φ (for Picture Tube)	4

Part No.	Description	Q'ty
	Nut	
7-622-207-01	2.6φ (for Telescopic Antenna Clamper)	1
-208-01	3φ (for Picture Tube (2), Table Stand (2))	4
4-003-355-01	6φ (for Grip Handle)	2
	Main Block	
	Screw	
7-621-261-02	⊕P 3φ×6 (for Tuner (2), Charger Switch (2), Volume Control (4), Multi-Jack (2), High Voltage Block (2), 4 P Plug (2), Fuse Holder (1), Adjustable Clamp (1), Power Transformer (2), Electrolytic Capacitor (1))	17
-52	⊕P 3φ×8 (for Video & Sound Signal Circuit Board)	2
-62	⊕P 3φ×10 (for Electrolytic Capacitor)	1
4-002-737-01	⊕P 3φ×23 (for Selenium Rectifier)	1
	Spring Washer	
7-623-208-21	3φ (for Tuner (2), Volume Control (2), High Voltage Block (2), Adjustable Clamp (1), Power Transformer (1), Charger Switch (2), Multi-Jack (1))	8
	Star Washer	
7-623-408-01	3φ (for Selenium Rectifier)	1
	Washer	
7-623-108-12	3φ (for Video & Sound Signal Circuit Board)	2
	Video, Sound Signal Block and Deflection Block	
	Screw	
7-621-261-62	⊕P 3φ×10 (for Transistor 2SC41)	4
-72	⊕P 3φ×12 (for Transistor 2SB232)	2
-255-52	⊕P 2φ×8 (for Transistor 2SC140)	2
	Star Washer	
7-623-408-01	3φ (for Transistor 2SC41 (4), 2SB232(2))	6
-405-01	2φ (for Transistor 2SC140)	2
	Nut	
7-622-308-01	3φ (for Transistor 2SB232 (2), 2SC41 (4))	6
-305-01	2φ (for Transistor 2SC140)	2

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